THE IRON TRADE REVIEW

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KEENER INTEREST

OF PIG IRON BUYERS SINCE RECENT HEAVY PURCHASES,

And the Market Shows General Improvement With Tendency Toward Higher Prices.—Railroads Again Placing Heavy Orders.

The heavy buying of steel making pig irons in the Pittsburg district last week has had a tendency to increase interest on the part of buyers of all grades of iron, although this effect is more noticeable in other centers than at the actual scene of the recent transactions. Especially in Chicago, Cincinnati and Cleveland are there indications of increased activity. Sales of fair tonnages of foundry iron have been made for the last half of the year and prices are hardening. In the south, although $18.50 can still be done for fourth quarter and for last half iron, $19 appears to be the minimum for third quarter iron. An occasional inquiry is being received for iron for the first quarter of 1908, and a few small sales have been made. Furnaces are disposed to quote for this far distant delivery, but it is not expected that much business will be done at present.

Railroad Purchases. Heavy buying by the railroads is again a feature of the market. The Tennessee Coal, Iron & Railroad Co. has sold 46,000 tons of open-hearth rails for 1908 delivery at $30; locomotive shops report that orders for new engines, which decreased for a time, are now coming in freely; numerous orders for structural material are pending and many orders for cars have recently been entered.

Shafting Improves. Shafting, which has been selling at very irregular prices for some time, is reported strong at Chicago and in Cleveland and other centers there is a disposition to insist upon higher prices. The demand is improving, and, on the whole, the outlook for this product is more encouraging. Several independent interests have followed the principal producer of pipe in withdrawing quotations, but the demand is undiminished. Jobbers are finding it difficult to keep their stocks replenished.

Wire Products. The American Steel & Wire Co., now has on hand orders about four times as large as those on the books at this time last year, and there is no prospect of a decrease in the demand for wire products. Specifications for shapes are heavy and are reported as coming from many sources, indicating prosperity in numerous lines. Ordering of cast iron pipe has been delayed in some instances on account of inability of municipalities to float bond issues. Bar iron prices show some irregularity.

Scrap and Coke Lower. Although there is considerable activity in the scrap market in some centers, the general tendency is toward lower prices. The demand for coke is not active and prices are lower.

Opening of Navigation. One small cargo of iron ore has been delivered at a Lake Erie port, but on account of the continued cold weather, there will not be a general opening of navigation for about 10 days or two weeks. Wage schedules of lake employes are being adjusted without difficulty, a number of advances having been granted.

New Buffalo Furnace.—It is announced the firm of Wickwire Bros., of Cortland, N. Y., manufacturers of wire in several forms, will build a blast furnace in Buffalo. The furnaces will be chiefly used for making pig iron for consumption in its own factory. It is reported that the concern has under consideration moving its business to Buffalo, but its plans have not assumed definite form as yet.

ORE LEASE APPROVED

At Annual Meeting of the United States Steel Corporation.—Directors Re-Elected.

At the annual meeting of the United States Steel Corporation, held Monday at Hoboken, N. J., the chief action of importance was the ratification of the Hill ore lands to the Great Western Mining Co., the arrangement being that the corporation is to guarantee the lease. At the meeting about 53 per cent of the outstanding stock was represented either in person or by proxy, and Judge E. H. Gary presided. The following directors whose terms expired were re-elected: Edmund C. Converse, Elbert H. Gary, James Gayley, J. Pierpont Morgan, Thomas Morrison, George W. Perkins, Henry Phipps and Henry H. Rogers.

When the matter of ratifying the ore lease was brought up, protest was entered by Clarence H. Venner, after which the motion to approve the deal was put and promptly carried. The details of the lease have been presented in detail in former issues of THE IRON TRADE REVIEW. It is to continue until the ore is exhausted unless terminated Jan. 1, 1915, by the corporation.

The routine annual meetings of a number of subsidiary companies were also held Tuesday, but no changes were made in their directorates.

BRISK BUYING OF PIG IRON.

(Special Telegram.)

New York, April 17.—The past few days have seen a brisk movement of iron for second quarter and last half. One large selling house reports one day's sales as equal to those of last month. Inquiry is increased, but no additional sales for next year other than those reported last week have been made. British markets are stronger. Cleveland warrants opened today at 55 shillings, 9 pence. Cargoes have been chartered to arrive at Philadelphia in June.

The Tennessee Coal, Iron & Railway Co. has sold for 1908 delivery 46,000 tons of open-hearth rails at $30. Another interest has sold for this year's delivery to the Montreal, Fresno & Eastern 20,000 tons of standard sections. Miscellaneous sales amount to 16,000 tons.

THE WEEK IN IRON CENTERS.

PITTSBURG

General Conditions Good, but Coke, Scrap and Bar Iron Not so Strong.

Office of THE IRON TRADE REVIEW.
521 Park Building, April 17

During the week under review market conditions have been strong and steady, with the possible exceptions of coke, scrap and bar iron, and in the last named product the weakness reflected has been from the Chicago district rather than from Pittsburg, although there has been some slight shading of bar iron prices by one of the local small interests. The leading local producers are firm at former quotations.

There has been a decided lull in pig iron transactions, due to an inclination on the part of furnace interests not already pretty well sold up for third quarter to hold for higher prices, and on the other hand a feeling by consumers that they may be able to secure iron for their requirements at a figure lower than is now being quoted. On this point consumers are about equally divided. Since the large transactions of W. P. Snyder and the Bessemer association to the Youngstown Sheet & Tube Co., and another large steel interest, there has been practically nothing done except in small lots and most of these were for practically prompt shipment, bringing fancy prices.

In finished lines there has been no change, either in market conditions or in prices, the only deviation from the past few weeks being a slight decrease in the new steel bar tonnage being placed with producers. This is due to a great extent to the far future delivery promises which mills are compelled to make on account of the filled-up condition of their books. Structural shapes are in greater demand due to specifications against contracts, as well as new business incident to the arrival of the spring building season and increased activity is noted from all parts of the country. In rails the new tonnage during the week was light but well distributed.

On sheet products the leading interest is accepting no further business for shipment during the second quarter and is taking on satisfactory tonnages of third quarter business. Independent sheet producers are not so filled up and can make deliveries on galvanized sheets and roofing in six to eight weeks. Manufacturers of merchant pipe are probably more congested than any other interests.

Pig Iron.—The large purchases by the Youngstown Sheet & Tube Co., and Cambria Steel Co., last week put a temporary quietus on the market and no transactions of note have been put through since that time. Since last week it has developed that the purchases of the Youngstown Sheet & Tube Co. for June and last half aggregate 170,000 tons of Bessemer, the June iron at $22, and last half at $21. Cambria's purchases were at the average monthly prices through the last half. With the sold-up condition of furnaces through the third quarter, there is an inclination to ask higher prices for the remaining iron, while on the other hand a considerable number of consumers are delaying their third quarter and last half purchases in the belief that they will secure concessions from the current quotations. Spot iron, or iron for delivery during the present quarter, is almost impossible to obtain and sales of northern No. 2 foundry iron have been made as high as $26, although $25 to $25.50 is the nominal market for spot iron. A small tonnage of prompt Bessemer sold at $23.50, and a like tonnage of basic at $23, valley furnaces. There is no fixed market price on prompt iron, the necessity of the consumer alone governing the price. It is not unusual to find a range of 50 cents to $1 in quotations, and only odds and ends are offered. Foreign iron is again becoming a factor, and No. 3 Middlesboro, which is on a parity with No. 2 soft southern, has been offered at $22 Pittsburg. On account of the almost total depletion of second quarter pig iron supplies, we now quote third quarter deliveries as follows:

Bessemer, Valley	$22.50 to 23.00
Bessemer, Pittsburg	23.35 to 23.85
No. 1 Foundry, Pittsburg	24.85 to 25.10
No. 2 Foundry, Pittsburg	24.35 to 24.85
Gray Forge, Pittsburg	21.85 to 22.35
Basic, Valley	22.00 to 22.25
Basic, Pittsburg	22.85 to 23.10

Ferro-Manganese.—There is a very irregular demand for prompt ferromanganese and during the past week a carload lot was sold at $74.50, Baltimore, equal to $76.50 delivered Pittsburg, while at the same time quotations ranging from $72 to $75 are being made for delivery during April and May and June, and $68 to $70 for last half. Imported 50 per cent ferro-silicon is quoted $110 Pittsburg; domestic 12 per cent, $36; 11 per cent, $35; 10 per cent, $34; with the lower grades imported ferro-silicon, $1 higher.

Steel.—The market on semi-finished material is purely nominal on account of the extreme scarcity. During the past week one sale of 1,000 tons of 4 x 4 Bessemer billets was made at $30.50 Pittsburg, but the necessity of the buyer probably brought the high price. One independent maker of sheet products is in the market for 15,000 tons of sheet bars for fourth quarter delivery and offered $30, but was unable to place his business. While the nominal quotation on sheet bars is $30, several small tonnages have been sold at $1 advance. Open-hearth billets are held nominally at $31.50 to $32.

Wire and Wire Nails.—With wire products the question is no longer one of securing contracts but is one of making shipments on existing obligations. Practically every producer is overwhelmed with the volume of business offered and operating to maximum capacity, but at the same time falling further behind on shipments. The delinquent tonnage is in such volume that it is doubtful about ability to clear it off during the season. Prices are unchanged as follows:

Wire nails, jobbers' carload lots, $2; retailers' carload lots, $2.05; less than carloads, $2.10; painted barb wire, $2.15, for jobbers in carloads; retailers in carloads, $2.20; and less than carload, $2.30 with 30c for galvanizing; plain wire, $1.85 for jobbers and $1.90 by carload.

Merchant Bars.—The implement manufacturers have been quizzing various steel bar producers individually, but no advances have been made by any committee authorized to treat in the matter of securing concessions at the time the yearly contracts are made. Producers as well as this branch of consumers are watching for developments and sitting tight and it is not likely that anything definite will be done much before June. Implement people are not quite satisfied in their own minds as to the outlook for next year and are satisfied to wait, as the result will undoubtedly be the same in June as now, when producers are firm against concessions from the current quotations. New bar business is light on all bar mill products including small shapes, but prices are firm and delivery promises far distant. Bar iron movements during the week have been slow, not exactly dead, but dragging, with a tendency to weaker prices, par-

ticularly in the Chicago district. The price for delivery in the Pittsburg district is 1.80c and for shipment west 1.65c Pittsburg, plus freight to point of shipment, but both of these prices have been shaded during the week. We quote:

Common iron bars, 1.80c Pittsburg in carload lots and over; 1.85c in less than carloads; Bessemer steel bars, 1.60c, net; plow and cultivator, 1.60c, net; channels, angles, zees, tees, under three inches, 1.70c, all f. o. b. Pittsburg. The following differentials are maintained on steel: Less than 2,000 pounds, 0.10c advance; less than 1,000 pounds of a size, 0.30c advance. Cold rolled and ground shafting, 50 per cent off in carload lots, and 5 per cent off in less than carloads, delivered in base territory; open-hearth spring steel, 2.25c to 2.50c; sleigh shoe flats, 1.60c to 1.65c; smooth finished machinery steel, 1.90c to 2c; toe calk, 2.10c to 2.15c. The price of planished and machine straightened tire is 1.80c, base, half tire extras. Iron finished tire up to 1½ inch and over to be sold on regular bar basis of 1.60c base, half extras, steel card.

Muck Bar.—A consumer in this district has been peddling his offer for a week, wanting 500 tons a month to July, but, as far as can be learned, was unable to find a mill to take it on. The nominal market for all pig metal bar is $37.50 to $38 Pittsburg, and part scrap bar, $36.75.

Sheets.—Specifications for black, blue annealed and galvanized sheets continue in very large volume and new business is heavy, extending through the third quarter of the year. Delivery promises on new business extend into August. As far as can be learned, there is no foundation for the report that negotiations are on between the Steel Corporation and the two sheet producers at Niles, O., tending toward the latter being absorbed by the leading interest. Prices are unchanged, some independent producers, however, are securing $2 to $4 premium for May and June delivery promises. We quote:

Black steel sheets one pass, cold rolled; Nos. 11-12, 2.20c; Nos. 13-14, 2.25c; Nos. 15-16, 2.30c; Nos. 17-21, 2.35c; Nos. 22-24, 2.40c; Nos. 25-26, 2.45c; No. 27, 2.50c; No. 28 2.60c; No. 29, 2.75c; No. 30, 2.85c; galvanized, Nos. 10-11, 2.65c; Nos. 12-14, 2.75c; Nos. 15-16, 2.85c; Nos. 17-21, 3.00c; Nos. 22-24, 3.15c; Nos. 25-26, 3.35c; No. 27, 3.55c; No. 28, 3.75c; No. 29, 4.00c; No. 30, 4.25c. Corrugated roofing, $1.85 per square for No. 28 painted, 2½-inch corrugation, and $3.25 per square No. 28.

Tin Plate.—While the volume of new business is not nearly as heavy as in sheets, it is very satisfactory and all for third quarter at current prices. Delivery promises are such that it is next to impossible to get tin plate short of three months. We continue to quote:

Coke tin plate, 100-pounds basis, 14 x 20, $3.90 f. o. b. mill, Pittsburg district. Terms, 30 days, less two per cent for cash in ten days.

Hoops and Bands.—Conditions have not changed since the first of the month and as purchases usually run from April to April or July to July, those contracts that have expired were as a rule renewed while the big business is expected at the middle of the year, bookings at this time running light, with deliveries holding about even with specifications. We continue to quote:

Hoops in carload lots, 2c; in less than carload lots, 2.10c; bands, 1.60c; base half extras as per standard steel.

Rails and Track Material.—The feature of the week in rails has been the action of the Tennessee Coal, Iron & R. R. Co., in taking on 46,000 tons of standard open-hearth rails for 1908 delivery, at $30. Rail producers in the north have not taken on any business for next year and as yet have not received inquiries for this delivery. The new tonnage taken on during the week under review was light and individual contracts small but well distributed. In light rails there is a better tone and improved deliveries have brought out heavier specifications and have resulted in substantial increase.

The Youngstown mill of the Carnegie Steel Co. is on sheet bars, but will probably go on rails at the end of two weeks. Prices are unchanged and we continue to quote:

Fifty-pound and heavier, 500-ton lots and over, $28; carloads and less than 50 tons, $30; less than carload lots, $32; 8-pound, $40; 12-pound, $36 to $37; 16-pound, $35 to $36; 20-pound, $34 to $35; 25 to 45-pound, $33 to $34; angle splice bars for standard sections, $1.65; spikes for forward deliveries, $2.50.

Merchant Pipe.—The only new business being taken on by makers of merchant pipe is from old customers as an accommodation, the Youngstown Sheet & Tube Co. being the only maker with card quotations, and these are nominal. LaBelle and Youngstown are accepting nothing for deliveries prior to July, and the National Tube Co. is practically filled to August, having withdrawn quotations prior to June, although all are accepting business for far future shipments subject to prices and deliveries to be determined later. The extreme discount on merchant pipe is 73 and 5 off on base sizes. We quote the following nominal discounts in carload lots:

	—Steel— black.	galv.
⅛ to ¼ inch	65	49
⅜ inch	67	53
½ inch	69	57
¾ to 6 inches	73	63
7 to 12 inches	68	53
EXTRA STRONG PLAIN ENDS.		
⅛ to ⅜ inch	58	46
½ to 4 inches	65	53
4½ to 8 inches	61	49
Double extra strong plain ends, ½ to 8 inches	54	43

Structural Material.—Structural business has shown considerable improvement, new inquiry is good, and the construction companies have gotten over their little scare brought about by the between season dullness. The largest single inquiry in this district is that of the Pittsburg Steel Co., for a new open-hearth building at Monnessen, Pa., to house eight new open-hearth furnaces and requires about 5,000 tons of structural material. Mills are receiving heavy specifications against contracts on their books, take a very optimistic view of the situation and point to the fact that their inquiries are not confined to those from the few large users alone but are general and from all parts of the country. New structural business for about three months from the beginning of the year has been the lightest of any of the finished lines and this condition has been welcomed rather than otherwise on account of the very heavy demands for semi-finished material by other finishing mills. Deliveries are also better in this branch of the trade than in others from a mill standpoint and construction companies are now well filled to capacity for some time ahead, notably the American Bridge Co., which will not make promises of delivery from its Ambridge plant before September. Mill prices are unchanged and we continue to quote as follows:

Beams and channels, 15-inch, and under, 1.70c; over 15 inches, 1.80c;. zees, 1.70c; tees, 1.70c; angles from three to six inches inclusive, 1.70c; over six inches, 1.80c; universal and sheared plates, 6¼ inches and wider, 1.70c base.

Coke.—The coke market has shown no particular strength during the past week, conditions remaining about as they have been for the past month. Shipments from the region are good and considerable spot coke is being offered, both furnace and foundry grades. The demand for foundry coke is fair and for spot shipment we quote $3.35 to $3.40, with last half coke at the same figure. Spot furnace coke is quoted $2.60 to $2.75, ovens. There is very little being done in last half furnace coke, consumers apparently not being interested at this time.

Old Material.—The scrap market is

and very little is being offered at any price and consumers have an adequate supply for present needs and are not worrying about the future. Prices are unchanged as follows, delivered in the Pittsburg district.

Heavy melting scrap, $18 to $18.25; re-rolling rails, $19 to $19.50; bundled sheet scrap, $16.50 to $16.75; iron axles, $30.50 to $31; old iron rails, $23 to $23.50; No. 1 wrought scrap, $19 to $19.25; old car wheels, $24.50 to $25; low phosphorus scrap, $22.50 to $23; machine shop turnings, $15.50 to $16; axle turnings, $16.50 to $17; cast borings, $13.25 to $13.75; No. 1 cast scrap, $20.50 to $21.

CHICAGO

Decided Improvement in Pig Iron.—Continued Activity in Finished Products.

Office of THE IRON TRADE REVIEW.
1362 Monadnock Block, April 16.

Aside from a livelier demand for pig iron and a noticeable strengthening of prices all along the line, local conditions have not sensibly changed in the past week. The improvement in pig iron was sharp and sudden, and is traceable directly to the recent heavy purchases of Bessemer iron from valley furnaces. The tonnage now available from these interests is represented as being very light, and for shipment prior to July 1 even carload lots are hard to obtain. Foundry and malleable irons from local furnaces are almost as scarce, and a serious shortage may be felt before the end of the year. Specifications for finished material show no evidence of declining. Demand is far greater than the supply, despite the fact that the entire output of mills goes into immediate consumption. The American Steel & Wire Co. has orders in hand four times greater than the tonnage on its books this time last year. Some large contracts involving structural steel for railroad consumption, as well as an order for 10,000 tons of heavy rails for a western line, have been closed this week. Inquiry from implement manufacturers for steel bars is increasing and some contracts have been placed. Consumptive demand for scrap is light and an easier tone prevails in that material.

Pig Iron.—Skepticism is no longer entertained as to the trend of prices for deliveries extending over the balance of the year. The large purchases of steel-making irons mentioned last week have eradicated all traces of weakness in the local market, and a sharp upward movement in foundry irons is early anticipated. The minimum quotation today for southern No. 2 foundry for the last half is $18.50 Birmingham. This price, however, is good only on orders for the full half, or for deliveries in the fourth quarter. For strictly third quarter requirements, the market ranges from $19 to $19.25 Birmingham for No. 2, representing an advance of 50 cents to 75 cents a ton for that delivery. These prices were quoted this week on an inquiry for 3,000 tons. Second quarter or spot shipment iron has not changed, quotations remaining at $21.50 to $22 Birmingham for May and June, and $22.50 to $23 for spot. The recovery from the recent indisposition appears to be complete, and while prevailing prices are considered high by many sellers, it is felt that impending events will force still higher levels. Inquiry is considerably more active and for larger units than has appeared since the first of the year. One pending order is for 9,000 tons of malleable, and ranging downward from this figure the list is heavy. The only open quotation on malleable iron for the last half is $24.50 Chicago, although it is admitted this might be shaded slightly to a good customer on desirable business. The valley price is $22 furnace, or $24.30 Chicago, and is adamant at that figure. There is so little northern iron available for spot shipment that sellers have no difficulty in securing $30 Chicago for any tonnage they might have to offer for that delivery. Foreign iron brings $28 to $28.50 Chicago and is eagerly taken at these prices. Every indication points to a shortage in local irons this year, and makers seem in no haste to add to their present obligations. One Chicago interest has only 15,000 tons of its second half output unsold, and this it is holding for deliveries in the last quarter. Other makers are but slightly better off. Practically all the charcoal iron that can be produced this year is now under contract, and current quotations are merely nominal. We quote for the last half as follows:

Lake Superior charcoal	$ 26.50
Northern Foundry No. 1	24.50 to 25.00
Northern Foundry No. 2	24.00 to 24.50
Northern Foundry No. 3	23.50 to 24.00
Northern Scotch Foundry	24.50 to 25.00
Ohio Strong Softeners No. 1	23.80 to 24.30
Ohio Strong Softeners No. 2	23.30 to 23.80
Southern Foundry No. 1	23.35 to 23.85
Southern Foundry No. 2	22.85 to 23.35
Southern Foundry No. 3	22.35 to 22.85
Southern Foundry No. 4	21.85 to 22.35
Southern No. 1 Soft	23.35 to 23.85
Southern No. 2 Soft	22.85 to 23.35
Southern Gray Forge	21.35 to 21.85
Southern Mottled	20.85 to 21.35
Southern Silveries, 4 per cent to 6 per cent Silicon	23.85 to 24.85
Jackson Co. Silveries, 8 to 10 per cent Silicon	30.30 to 32.30
Malleable Bessemer	24.00 to 24.50

Billets and Rods.—Crude steel continues very scarce. Inquiry is plentiful, but the heavy movement in finished material has induced a conservative course in the disposition of intermediate products. Only forging billets are obtainable for anything like a reasonable delivery, and these are doled out in carload lots at prices ranging from $36 to $38 Chicago. Wire rods are still harder to obtain, and no open quotation exists. Prices range from $37 to $40 Pittsburg, according to the tonnage and delivery required.

Iron and Steel Bars.—No developments of interest have transpired in the current week. Prices are firm and unchanged at 1.65c Pittsburg for bar iron, and 1.60c Pittsburg for steel. Specifications are extremely heavy, while new tonnage shows a gradual increase. Implement interests are buying a little more freely, but are not covering far ahead. We quote as follows:

Soft steel bars and bands, 1.76½c, half extras; soft steel angles, less than 3 x 3, 1.86½c; hoops, 2.16½c base, full extras. We quote bar iron from stock, 2.25c, full extras; soft steel rounds and squares, 3 inches and larger, $2 per 100 pounds base; flats, 2 inches to 4 inches by ⅜ inch and larger, $2 per 100 pounds base; 4½ inches x 5 inches and 6 inches x 5-16 inch and thicker, $2 per 100 pounds base; all ovals, half rounds, $2 per 100 pounds base; steel bands, $2, half extras; soft steel hoops, 2.40c to 2.50c full extras. Other sizes not mentioned above, $2 per 100 pounds base plus half extras.

Plates.—The local situation is without noticeable change. New tonnage more than offset the depletion of existing contracts, with the result that no progress is made towards relieving the congestion on mill order books. Deliveries are slow, and doubtless will continue so for the balance of the year. Prices are as follows:

Plates ¼ inch and thicker 6⅛ to 100 inches wide, either universal or sheared, 1.70c Pittsburg base. For extras see Pittsburg report. Freight rate to Chicago, 16½c per 100 pounds. Jobbers' prices for shipment from local stocks are as follows: Tank steel ¼ inch and heavier up to 72 inches wide, 2.20c; 3-16 inch up to and including 60 inches wide, 2.30c; 3-16 inch 72 inches wide, 2.55c; No. 8 up to 60 inches wide, 2.35c. Flange steel, 25c extra; heads, 25c extra.

Sheets.—There is no decline in the demand for sheets. Contracts are being made for requirements extending through the remainder of the year, and indications are that every plant in the central west will operate to full capacity during this period. Consumers are pressing insistently for shipments, and frequently request anticipation of their contract quotas. Jobbers' stocks are kept replenished only at the expense of con-

siderable labor and by purchasing "pick-up" lots wherever obtainable. Quotations are very firm as given below:

Black sheets Nos. 8, 9 and 10, 1.90c Pittsburg; No. 28 gage, 2.60c Pittsburg. Galvanized sheets No. 28 gage, 3.75c Pittsburg. Freight to Chicago 16½c per 100 pounds. Jobbers' prices on less than carload lots from store are as follows: No. 10, 2.25c to 2.30c; No. 12, 2.30c to 2.35c; No. 14, 2.35c to 2.40c; No. 16, 2.45c to 2.50c; Nos. 18-20, 2.70c to 280c; Nos. 22-24, 2.75c to 2.85c; No. 26, 2.80c to 2.90c; No. 27, 2.85c to 2.95c; No. 28, 2.95c to 3.05c; No. 30, 3.35c. Galvanized sheets, Nos. 10 to 20, 3.40c to 3.45c; Nos. 22 and 24, 3.55c to 3.60c; No. 26, 3.75c to 3.80c; No. 27, 3.95c to 4c; No. 28, 4.15c to 4.20c; No. 30, 5.35c to 5.40c.

Structural Steel.—In direct contradiction to the reports of railroad cancellations is the large amount of material these interests are taking. Within the past week, the Illinois Central has ordered steel underframes for 400 cars, involving about 2,000 tons of structural shapes; the Michigan Central has contracted for 4,000 tons of fabricated bridge material and Chicago Northwestern 1,900 tons of structural steel. Contracts have also been placed with the American Bridge Co. for 3,200 tons from the Nevada Consolidated Copper Mining Co., Ely, Nev., and 800 tons for the Wisconsin Steel Co. Milliken Brothers are also reported to have received the contract for the Frye building, Seattle, 1,000 tons; Mechanics bank, San Francisco, 900 to 1,000 tons, and the Baldwin building, Portland, Ore., 500 tons. Specifications on local mills indicate that the improved movement noted a week ago continues without diminution. Prices are without change as follows:

Beams and channels, 3 to 15 inches inclusive, 1.70c Pittsburg. For extras see Pittsburg report. Freight rate from that city to Chicago is 16½c per 100 pounds. Quotations from stores are as follows:

All angles, three inches and larger, including six inches, $2.05 to $2.10 per 100 pounds; angles over six inches, $2.15 per 100 pounds base, beams, three inches to 15 inches, inclusive, $2.05 to $2.10 per 100 pounds base; channels, three inches and larger, $2.05 per 100 pounds base. Less than carload lots are $1 a ton higher than foregoing prices.

Rails and Track Supplies.—New tonnage in heavy rails for this year's delivery has been augumented this week by a large order from a western trunk line. Traction enterprises, however, continue the most prolific buyers and could satisfactory deliveries be made the aggregate tonnage from this source would be much larger. Light rails and track supplies show a steady movement, but only late deliveries can be given on new business. We quote as follows:

Bessemer rails, $28 to $30; less than 500-ton lots, $32; open-hearth rails, $29; light rails, Bessemer, 30 to 45-pound sections, $35; 25-pound, $36; 20-pound, $37; 16-pound, $38; 12-pound, $39, and lighter sections down to 8-pound, $45.50, all f. o. b. mill. Track supplies vary in price according to quantity and delivery. On orders accompanying rail contracts for future delivery, we quote angle bars, 1.65c; spikes, 2.35c; bolts with square nuts, 2.65c; with hexagon nuts, 2.80c. For carload lots or less, for prompt shipment, the following prices are asked: Angle bars, 2.25c to 2.75c; spikes, 2.60c to 2.70c; bolts with square nuts, 2.85c; with hexagon nuts, 3c.

Merchant Steel.—Some season contracts have been placed by implement interests in the past week, and several other consumers have been sounding mills preparatory to doing likewise. Beyond this, no change in conditions is noted. Specifications continue extremely heavy and deliveries are slow. We quote as follows:

Planished or smooth finished tire steel, 1.96½c; iron finish, up to 1½ x ½ inch, 1.91½c base; iron finish, 1½ x ½ inch and larger, 1.76½c base; channels for solid rubber tires, ¾ to 1 inch, 2.26½c, and 1⅛ inch and larger, 2.16½c; smooth finished machinery steel, 2.16½c; flat sleigh shoe, 1.81½c; concave and convex sleigh shoe, 2.06½c; cutter shoe, 2.35c; toe calk steel, 2.31½c; railway spring, 1.96½c; crucible tool steel, 6½c to 8c, with higher prices asked on special grades. Shafting is very strong. Quotations are without change at 50 per cent off in car lots and 45 per cent in less than car lots in base territory.

Cast Iron Pipe.—In the aggregate, a large volume of business, made up of inquiries ranging from 500 to 1,000 tons, is pending. Prices are very firm, but without change. We quote four-inch water pipe, $38.60; six to 12-inch inclusive, $37.60; 16-inch and upward, $36.60; gas pipe, $1 a ton higher.

Merchant Pipe and Boiler Tubes.—The National Tube Co. is bending every effort to place itself in position to reopen its books June 1. So far, however, little progress has been made in overtaking shipments, and on the smaller sizes of butt and lap welded pipe especially, the congestion continues very severe. Outside makers are in very little better position so far as forward shipments are concerned, and new tonnage is not being taken with any guarantee of delivery. Jobbers report a very brisk demand from stock. The following prices are those of a large independent maker, and are on the basis of Pittsburg delivery:

Random lengths with thread couplings, ⅛ and ¼ inch, 65 per cent discount off for black and 49 per cent off for galvanized; ¾ inch to 6 inches, 73 per cent off for black and 63 per cent off for galvanized; 7 to 12 inches are quoted at 68 and 53, respectively. Extra strong plain ends are held at 58 off for black and 46 off for galvanized, in sizes from ⅛ to ⅜ inches, and at 6 and 49 respectively for 4½ to 8 inches.

Chicago jobbers are quoting 70 off for black steel pipe, ¾ to 6 inch, and iron pipe at four to five points higher. Tubes are unchanged at 60 off for steel, and 47½ off for iron and seamless.

Wire Products.—With specifications in hand four times larger than they were in April, 1906, the condition of wire mills may be measurably realized. All sections of the country are clamoring for material. Stocks are low and consumption is unusually heavy; and though the entire output of mills goes into immediate consumption, it falls below the needs of the hour. Prices are very firm, as follows:

Wire nails, $2.15; painted barb wire, $2.30; galvanized barbed wire, $2.60; smooth annealed wire, $2.30; polished staples, $2.55. Carload lots to retailers, five cents higher; less than carload lots, 15 cents higher.

Coke.—Coke is slow in gathering strength, and though without actual changes, the market is softer. Contracting for forward deliveries continues good, but spot demand is lighter. Connellsville foundry coke for the last half is held at $3.50 ovens, but for shipment in the second quarter prices range from $3.40 to $3.50 ovens. Solvay coke for quick shipment is firm at $6.75 Chicago, and $6.50 for the second half.

Old Material.—The local market is not sensibly changed from the conditions reported a week ago. Material is plentiful and consumptive demand is light. The improved shipments of pig iron in the past month have lessend the demand for foundry scrap, and these grades have slightly declined in consequence. The principal transaction in the past week was the purchase of a round tonnage of re-rolling rails by a local mill, which paid on the basis of $18.60 Chicago for forward delivery. The entire ten thousand tons of scrap offered by railroads, as mentioned last week, has been wholly absorbed. We have revised our prices,

and quote as follows gross tons being given in the first paragraph:

Old Steel Rails (less than 3 feet)	$17.50 to 18.00
Old Car Wheels	25.00 to 25.25
Old Iron Rails	24.50 to 25.00
Rerolling Rails (3 feet and over)	18.50 to 19.00
Light Section Relayers, 45 lbs. and under, subject to inspection	30.00 to 32.00
Relaying Rails, subject to inspection	31.00 to 31.50
Frogs, Switches and Guards	16.50 to 17.00
Heavy Melting Steel	15.50 to 16.00
Mixed Country Steel	12.50 to 13.00

We quote net tons as follows:

No. 1 R. R. Wrought	$15.25 to 15.50
No. 2 R. R. Wrought	14.25 to 14.50
Shafting	17.00 to 17.50
Dealers Forge No. 1	12.00 to 12.50
Wrought Pipe and Flues	12.00 to 12.50
No. 1 Cast, 150 lbs. and less	19.00 to 20.00
No. 1 Mill	10.00 to 10.50
Mixed Busheling (No. 1 & No. 2)	11.00 to 11.50
Country Sheet	8.50 to 9.00
No. 1 Boilers Cut	11.50 to 12.00
Boiler Punchings	15.00 to 15.50
Cast Borings	9.50 to 10.00
Mixed Borings, etc	9.50 to 10.00
Machine Shop Turnings	11.50 to 12.00
Railroad Malleable	16.50 to 17.00
Agricultural Malleable	15.50 to 16.00
Stove Plate and Light Cast Scrap	15.00 to 15.50
Old Iron Splice Bars	19.50 to 20.00

CLEVELAND.

More Activity in Pig Iron.—Strong Demand for Pipe.—First Ore Received.

Office of THE IRON TRADE REVIEW.
Browning Building, April 16

Iron Ore.—The first cargo of ore to come to Lake Erie this season arrived April 15, being brought by the small steamer Christopher from Escanaba, and shipped by Corrigan, McKinney & Co. to Cleveland. Ice conditions in the St. Mary's river have not improved during the past week, and vessels may not pass through the locks at the Soo before April 25. A large fleet of upbound steamers, including two that started from Lake Erie ports April 1, are still detained at Detour. Advances in wages of about 10 per cent have been granted seamen, firemen, oilers and water tenders. The cooks have been given an advance of 7 per cent. The Lake Carriers' Association now has agreements for the season with all the labor organizations that had contracts in 1906, and peace between employers and employes throughout the season seems to be assured. The movement of ore from docks to furnace yards continues at a a lively rate.

Pig Iron.—The sales of heavy tonnages of steel making iron last week have had the effect of increasing interest in the market for foundry iron, of which a fair tonnage for last half delivery has been sold, and the inquiry is much more active. The minimum valley price for No. 2 foundry for last half is now $22, and the price at Cleveland furnaces for local consumption is $22.50. Some basic has been sold for last half at $21 valley, but sellers are not anxious to take orders at that figure. We quote, f. o. b. Cleveland for last half delivery, as follows:

Bessemer	$ 21.85
No. 1 Foundry	23.00
No. 2 Foundry	22.50
No. 3 Foundry	22.00
No. 2 Southern	22.85
Gray Forge	21.00

Coke.—The market is extremely quiet, prices showing a tendency to sag. For the remainder of the year we quote furnace coke at $2.75 at the ovens, and foundry at $3.35 to $3.40.

Finished Material.—A very strong demand for pipe continues in spite of the fact that the leading producer and also independent interests have withdrawn quotations. It is very difficult to place orders for anything like prompt delivery. The shafting market, which has been very irregular for some time, shows signs of improvement, and there are indications that higher prices will be demanded. One Cleveland manufacturer positively refuses to sell except at satisfactory prices. It is understood that some important bolt and rivet manufacturers have been endeavoring to sound the market as to whether it would be possible to make new contracts for steel bars at less than 1.60c Pittsburg, but there are no indications that any concessions will be made. The market for bar iron is somewhat irregular, and low prices are again being made by some Indiana interests. Jobbers report the greatest business in all lines ever enjoyed. They are having considerable difficulty in keeping up their stock.

Old Material.—Bearish sentiment is more pronounced in the market and a number of declines in various grades are noted. Some dealers take the view that a further drop may be expected. Offerings continue to be freer. One dealer was able to purchase a considerable tonnage of steel scrap at a less price than he had given the same party for a smaller lot several days earlier in the week. A number of large railroad lots, including the B. & O., Pennsylvania lines west, Norfolk & Western and the Southern lines, have been sold during the past week. We have revised our quotations and quote, f. o. b. Cleveland, gross tons, as follows:

Old iron rails	$25.00 to 26.00
Old steel rails (re-rolling)	18.00 to 19.00
Old steel rails (under 6 feet)	18.50 to 19.50
Old car wheels	23.00 to 23.50
Steel boiler plate	14.00 to 14.50
Steel axles	21.50 to 22.50
Malleable iron (railroad)	18.50 to 19.00
Malleable iron (agricultural)	16.50 to 17.00
Heavy steel	16.50 to 17.00
Country mixed steel	14.50 to 15.50
Low phosphorus	21.50 to 22.50

We quote net tons as follows:

No. 1 R. R. wrought	$16.50 to 17.50
No. 1 busheling	13.50 to 14.00
No. 1 machine cast	17.50 to 18.50
Iron axles	25.50 to 26.00
Axle turnings	14.00 to 14.50
Wrought turnings (free from cast)	12.75 to 13.25
Grate bars	14.00 to 15.00
Pipes and flues	13.50 to 14.00
Tank iron	12.00 to 13.00
Hoop and band iron	8.50 to 9.00
Sheet iron	7.50 to 8.50
Wrought drillings	13.00 to 13.50
Stove plate	14.00 to 15.00
Cast borings	10.75 to 11.25

CINCINNATI.

Pig Iron Market is Stronger and Buying Movement for Last Half is Probable.

April 15.

Pig Iron.—There is a stronger tone to the market this week. More inquiry has come out for the last half of the year, and several pending contracts have been closed. One Ohio melter closed for 2,600 tons of northern iron and 1,000 tons of southern, deliveries June to September. Another bought 1,000 tons of northern iron for third quarter delivery. A local foundry took 900 tons for second half delivery at $18.50 Birmingham. Another local melter is in the market for 750 tons. Two Indiana inquiries are pending, one for 2,500 tons and one for 400 tons. An Ohio manufacturer asks for prices on 1,300 tons for the last half. Another has closed for 500 tons with 500 tons still pending.

Deliveries have been exceptionally good for the last few weeks and this has relieved the need for spot iron to such an extent that prices are easier. Prompt shipment iron is now quotable at $22.00 to $22.50 Birmingham, with May and June deliveries quoted at $21.50 Birmingham with the usual 50 cents difference between the grades. We quote for prompt shipment, delivered Cincinnati, as a basis for settling contracts based on our quotations as follows:

Southern foundry No. 1	$25.75 to	$26.25
Southern foundry No. 2	25.25 to	25.75
Southern foundry No. 3	24.75 to	25.25
Southern foundry No. 4	23.75 to	24.25
Southern No. 1 soft	25.75 to	26.25
Southern No. 2 soft	25.25 to	25.75
Southern gray forge	21.75 to	22.25
Northern No. 1 foundry	26.65 to	27.75
Northern No. 2 foundry	26.15 to	27.15
Northern No. 3 foundry	25.65 to	26.65

Reports concerning the general situation are stronger. Northern furnaces in the Ironton district have but little iron left for the third quarter, and the heavy shipments from the south have reduced stocks in Alabama to a considerable extent. Continued reports of difficulty of operation of southern stacks are coming in. One of the large producers in the south is still freely taking business at $18.50 Birmingham, but aside from this important interest, a $19.00 price is being maintained quite generally. Inquiries from points outside of this territory are better, and there is a belief expressed

that a buying movement for the last half of the year is probable in the near future. Confidence in the situation is shown by the booking of a cargo of import iron by one of the firms represented here. The inquiries now under consideration develop the fact that it is difficult for agencies to find iron for the specified deliveries wanted by prospective purchasers. We quote for last half delivery delivered Cincinnati, as follows:

Southern Foundry No. 1	$22.25 to 22.75
Southern Foundry No. 2	21.75 to 22.25
Southern Foundry No. 3	21.25 to 21.75
Southern Foundry No. 4	20.75 to 21.25
Southern Foundry No. 1 soft	22.25 to 22.75
Southern Foundry No. 2 soft	21.75 to 22.25
Gray Forge	19.75 to 20.75
Northern Foundry No. 1	22.65 to 23.15
Northern Foundry No. 2	22.15 to 22.65
Northern Foundry No. 3	21.65 to 22.15
Jackson County Silvery, 8 per cent	30.15 to 31.15

Finished Material.—Retail business is good and the jobbers are holding for full quotations. Retail orders are filled here at the following prices:

Angles, 3 x 3 and over, 2.15c to 2.25c; beams and channels, 15 inches and under, 2.15c; small angles and architectural channels, 2.10c base; plates ¼ inch and heavier, 2.10c; 3-16 inch, 2.20c; No. 8, 2.20c; sheets (blue annealed) No. 10, 2.30c; No. 12, 2.35c; No. 14, 2.40c; No. 16, 2.50c; box annealed sheets, Nos. 18 and 20, 2.65c; Nos. 22 and 24, 2.75c; Nos. 25 and 26, 2.80c; No. 27, 2.85c; and No. 28, 2.95c. Iron and steel bars, 2.00c base; boiler tubes, 60 per cent off base; turnbuckles, 45 per cent off; rivets, 3.15c base; cold rolled shafting, 45 per cent off list; steel tire, 2.10c base.

Coke.—The blowing out of some furnace stacks has thrown some coke on the market for prompt shipment at low prices. The flood in Pittsburg also reduced requirements of Connellsville foundry coke temporarily and prompt shipment coke is easy in all districts. There are a few inquiries for forward shipment, but contract prices are not established. Prices in the leading coke producing districts are as follows:

Wise County, Va., Furnace Coke, prompt shipment	$2.75 to 2.90 per ton
Wise County, Va., Foundry Coke	3.60 to 3.75 per ton
Pocahontas Furnace Coke, prompt shipment	2.75 to 2.90 per ton
Pocahontas Foundry Coke	3.50 to 3.60 per ton
Connellsville Furnace Coke, prompt shipment	2.90 to 3.00 per ton
Connellsville Foundry Coke	3.40 to 3.60 per ton
New River Foundry Coke, prompt shipment	3.50 to 3.60 per ton
New River Furnace Coke, prompt shipment	2.75 to 2.90 per ton

*Wise County, Va., Coke on Furnace contracts is sold mainly on a sliding scale basis for pig iron prices on the following basis: $1.70 to $1.75 per ton on $9.00 pig iron, plus 19 to 20 per cent of the advance on pig iron above $9.00 Birmingham.

Old Material.—The market is easier and offerings are free and at fairly attractive prices to consumers, as compared with pig iron. We quote f. o. b. Cincinnati:

Old No. 1 R. R. wrought net tons	$17.00 to 18.00
Cast machine and f'dy, net tons	18.00 to 19.00
Old iron rails, gross tons	25.50 to 26.50
Old steel rails, gross tons	19.00 to 20.00
Old short lengths, gross tons	19.00 to 20.00
Old iron axles, net tons	26.00 to 26.50
Heavy melting scrap, gross tons	20.00 to 21.00
Stove plate, net tons	15.50 to 16.00
Wrought turnings, net tons	13.50 to 14.00
Cast borings, net tons	11.00 to 11.50
Car wheels, gross tons	23.50 to 24.00

Ray Fox, formerly with the Columbus Iron & Steel Co., has taken service with the Cincinnati office of Hickman, Williams & Co.

PHILADELPHIA.

Locomotive Works Report Renewed Buying.—Pig Iron Buyers Hesitate.

April 16.

Pig Iron.—Buying for the last half continues the feature of greatest interest, and the market shows great strength. Reports from Pittsburg, showing the heavy sales made there during the past week have had their share in stimulating the situation here, and some large sales have been made. Some important consumers have still failed to cover their requirements for the third quarter and it is difficult to see how they can get in now without having to pay roundly for the delay. Those who held back on their second quarter supplies are now willing to pay nearly any price for iron, and if it were not for the large amounts of Middlesboro coming in, there is no doubt that many establishments would have to close. Purchases of English iron have been made by the chief importing interest up to July, and ready sales are confidently expected of all that can be brought in. There is still a disposition among many consumers to hold off on the last quarter, but buyers who are considered especially careful are covering the entire last half. There has been no notable change in prices, but as the third quarter approaches there is a natural tendency in these to approach the higher figures in the range of quotations for the last half. These are about as follows:

No. 1X Foundry	$25.00 to 25.50
No. 2X Foundry	23.50 to 24.50
No. 2 Plain	23.00 to 23.50
Standard Gray Forge	22.25 to 22.75
Basic	23.75 to 24.50
Low Phosphorus	27.00 to 27.50

New Material.—Reports from mills received by a large house here show that there are few which have not enough to keep them going steadily for three months, while some are assured of activity for at least eight months. It is significant, as bearing up on the railroad demands for new equipment and material, that the Baldwin Locomotive Works, which during the stock market panic of a month ago, did experience a slight falling off in new orders, report that these are now coming in in as great volume as ever and that the railroads are making large purchases. Steel bars are especially strong, but the demand for plates is slightly relaxed, with prices a trifle easier. Prices, which show little change, may be quoted as follows: Beams, channels and angles, according to specifications, 1.83½c to 2c; refined iron bars, 1.88½c to 1.93½c; steel bars, 1.83½c to 1.88½c; plates, 2.08c to 2.13½c.

Old Material.—There seems to be a lack of confidence in the ability of holders of scrap to maintain present prices, and as a result they in many lines show a slow decline. The mills contend that present prices are still too high, in comparison with what they receive for the finished product, and are placing orders sparingly. Prices may be quoted as follows:

Old steel rails	$19.00 to 19.50
No. 1 steel scrap	18.25 to 18.75
Old steel axles	22.00 to 22.50
Old iron axles	29.00 to 30.00
Old iron rails	25.50 to 26.50
Old car wheels	22.50 to 23.50
Choice scrap R. R. No. 1 wrought	19.75 to 20.25
No. 1 yard scrap	18.00 to 18.50
Machinery Scrap	21.50 to 22.00
Low phosphorus scrap	22.50 to 23.00
Wrought iron pipe	16.00 to 17.00
No. 1 forge fire scrap	16.50 to 17.00
No. 2 forge fire scrap, ordinary	11.50 to 12.00
Wrought turnings	16.50 to 17.00
Axle turnings, heavy	17.00 to 17.50
Cast borings	15.00 to 15.50
Stove plates	17.00 to 17.50

NEW YORK.

Continued Reduction of Pig Iron Stocks in England.— Foundries are Busy.

Office of THE IRON TRADE REVIEW,
Room 1315, No. 150 Nassau St., April 16.

Pig Iron.—Interest in the east is still largely centered in the British market where the only large stocks of iron in the world are held today and cable advices are that the situation is very strong. Some idea of the inroads which exportations are making into British stocks can be gained from the fact that during the first quarter of this year accumulations at Middlesboro decreased almost 50,000 tons, while in the corresponding period of 1906 a gain of more than 85,000 tons was recorded. Roughly speaking, 500,000 tons were in storage April 1, 1907, against about 800,000 tons April 1, 1906. Germany, which during January and February bought only a small tonnage took more than 30,000 tons of all brands during March and that movement is keeping up while Holland and several other consuming countries are competing with America to fill their needs. In the Middlesboro district the export movement is limited only by the capacity of docks and frequently three times as many vessels as can be accommodated are waiting for loading. In cargo lots it is reported that No. 3 can be purchased at slightly less than

$20.00 tidewater. In domestic irons a considerable inquiry for moderate tonnages is reported, though no large lots are being negotiated for. Foundry interests are extremely busy, with orders to capacity, except in the case of those supplying the building trade, where it is stated the demand is light and keen attention has to be paid to credits. Several lots of iron of good size, which have been on the market for some time, have been closed and in addition to the sale of 500 tons of foundry iron for the first quarter of 1908, reported last week, another instance has come to light of a sale for delivery running through January of next year. Rumors have been current that $18.50 Birmingham, could be shaded for No. 2 southern, but it is known to be true that one important producer declined to sell a lot of 1,000 tons for the last half at less than $19.00. Several Virginia furnaces have announced slight advances. We quote, second half delivery at tidewater, as follows:

Northern Foundry No. 1	$24.00 to 24.50
No. 2 Foundry	23.50 to 24.00
No. 2 Plain	23.00 to 23.50
No. 1 Southern Foundry	22.50 to 23.00
No. 2 Southern Foundry	22.00 to 22.50
No. 3 Southern Foundry	21.50 to 22.00
No. 4 Southern Foundry	21.00 to 22.00

Finished Materials.—Structural orders closed during the week include few large orders. The American Bridge Co. has taken 1,200 tons for a Nevada smelting plant, 1,200 tons for an addition to a California cement plant and 800 tons for a blast furnace building for the Wisconsin Steel Co. A large tonnage of smaller orders has also been closed. Estimates are being sought on an unprecedentedly large number of jobs which are coming out much more freely than heretofore. The volume of specifications for this early in the season is heavier than ever before known and those holding season contracts are hounding the steel mills for deliveries. The Chicago, Lake Erie & Eastern railway will shortly be in the market for 3,000 tons of fabricated steel. Difficulty in floating bonds is causing a number of municipalities to delay placing orders for cast iron pipe which will be needed during the coming season. New orders are few and small, but producers are sold well into the fall and are not worrying.

In plates those interests able to offer prompt delivery are taking a considerable volume of current business at premium prices, as the basis of 1.70c, Pittsburg, involves a delay of eight weeks on an average. We quote tidewater prices as follows:

Angles, 3 to 6 inches x ¼ inch and heavier, 1.84½c; beams, 3 to 15 inches, 1.84½c; tees, 3 x ¼ inch and heavier, 1.89½c; plates, carloads, tank, 1.94½c; marine boiler, 2.24½c refined iron bars, 1.89½c; soft steel bars, 1.74½c; sheets, No. 28, black, 2.60c.

Old Materials—Except in wrought scrap the market continues active, with mills buying heavily. Heavy cast scrap is slightly lower in consequence of a freer offering of pig iron. Heavy steel is in good demand. We quote gross tons, New York delivery, as follows:

Old iron rails	$22.50 to 23.50
Old steel rails, long lengths	18.00 to 18.50
Old steel rails, short pieces	16.00 to 16.50
Relaying rails	28.00 to 29.00
Old car wheels	22.00 to 23.00
Old iron car axles	28.50 to 29.50
Old steel car axles	21.00 to 21.50
Heavy melting steel scrap	16.00 to 16.50
No. 1 railroad wrought scrap	19.00 to 19.50
Iron track scrap	17.50 to 18.00
Wrought pipe	14.50 to 15.00
Cast borings	13.00 to 13.50
Wrought turnings	14.75 to 15.25
Heavy cast scrap	19.00 to 19.50
Railroad malleable	15.00 to 15.50
Agricultural malleable	14.50 to 15.00
Stove plate	15.50 to 16.00
Grate bars	14.50 to 15.00

BUFFALO.

Pig Iron Market Quiet, But Prices Are Firm.—Tone is Strong.

April 16.

Pig Iron.—Very few sales of prompt or last half delivery iron have been made the past week, the market being quiet all around, but prices hold firm and the general tone is strong. A few odd lots of prompt iron have been sold to supply urgent needs. Heavy consumers are pressing hard for deliveries on contracts and stiff prices continue to be offered for prompt deliveries on contracts.

It has been noticed at the furnaces that big consumers are making inquiries and trying to learn the pulse of the market here. One large eastern concern felt the local market on a possible contract for 17,000 tons of No. 2 Foundry. This is one of the largest inquiries noticed here in a long time, but at present it is a case of the heavier interests looking carefully into the market and endeavoring to keep a line on the situation. This is what has been expected by many who have watched the market for the last few months. The fact that most of the year's output has been covered makes it necessary for such as desire to protect their future business to make sure of later deliveries.

Many of those who were here with inquiries for last week and the week previous are not reported as having placed their contracts. Naturally consumers are a bit uneasy owing to the fact that furnaces are sold out so far into the future. Little iron is now being promised for the last half. While the buyers are trying to protect themselves, the furnaces also are obliged to guard against any inability which might be experienced in filling orders.

There is a strong call for prompt foundry iron of the various grades and especially No. 2 Foundry. There is now a dearth of English iron in the Buffalo district, but a good many cargoes were disposed of throughout the winter, most of which were placed since the first of the year. It is unusual for Scotch iron to be placed here, but the scarcity of the local product in the prompt market has led certain interests to use some Scotch. The shipment, however, is not due here for several weeks. No change in prices is reported this week. For last half delivery we quote as follows:

No. 1X Foundry	$22.75 to 23.25
No. 2X Foundry	22.25 to 22.75
No. 3 Foundry	21.50 to 22.00
No. 2 Plain	22.00 to 22.50
Malleable Bessemer	22.50 to 23.00
Gray Forge	21.50 to 22.00
Charcoal	26.00 to 27.00

ST. LOUIS

Molders' Strike Will Probably Not Be Declared—Pig Iron Stronger.

April 15.

It is not generally believed here that the threatened strike of iron molders, scheduled to take place July 1, will materialize. The stove men have settled their differences with their molders by granting the men an advance of 5 per cent, and the machinery houses have granted an increase of 15 cents to their molders. No molders are out in this district, and the melters insist that they have made all the concessions they intend to, and the matter will be dropped.

Pig Iron.—The market has ruled a little stronger, with more inquiries. Deliveries have been better, and spot has had little demand. Our prices, including the freight rate of $3.75 from Birmingham, range as follows:

Southern No. 1	$22.75 to 23.25
Southern No. 2	22.25 to 22.75
Southern No. 3	21.75 to 22.25
Southern No. 4	21.25 to 21.75
Gray Forge	19.75 to 20.25

Southern No. 2 for immediate delivery is quoted at $22.50 to $23. The lowest prices quoted for iron shipments over last half is $18.50. For May and June the quotations f. o. b., Birmingham, are $21.50 to $22.

The American Car & Foundry Co. is reported to have placed its order for 1,000 tons of No. 2 foundry for the second quarter. The tendency seems to be toward firmer prices.

Coke.—This is maintaining an even tone. The present prices are from

$3.50 to $3.75 for 72-hour Connellsville ovens. Virginia and West Virginia hold the same. The demand is not great.

BIRMINGHAM, ALA.

Iron on Furnace Yards Moving Rapidly.—Many Inquiries.

Birmingham, Ala., April 15.

The surplus iron and cast iron pipe in Alabama on the furnace yards and elsewhere will have been moved out by the end of the month, if the present conditions with the transportation facilities continue through the month. This means that next month the deliveries will be on the daily make and the strong market will take on additional strength. While there have been no special incidents during the past week in the southern iron market, save the visit to this part of the country by several men interested in pig iron and pipe, the business transacted has been most satisfactory and the inquiries would indicate that there is need for a large quantity of iron. The production in this state is still off decidedly. There is talk of furnaces being started up in the near future, but nothing definite in that line is happening.

Spot iron is still in demand and commands from $21.50 to $23 per ton. Some small lots are to be obtained. It is given out on the best of authority that as soon as the surplus iron has been moved out, as stated above, either the spot iron prices will have to descend or the last half of year iron will advance. The intimation given a few weeks ago that there was likely to be an advance in iron prices has not yet been realized, though recently the $19 per ton, No. 2 foundry, price for delivery during the last half of the year became more pronounced. There is still iron being sold at $18.50 per ton.

Furnaces in the immediate Birmingham district are selling only for delivery after October, while in Sheffield and one or two other places in the state some little business is still going on for iron before October. A large proportion of the probable make in the immediate district after October has been sold.

Molders in the stove and other foundries in the Sheffield, Ala., district are out on strike. The men demand an increase in wages, they now working on piece work.

The Shelby Iron Co. and the Williamson Iron Co. are jointly interested in a new ore mining company just formed and which has acquired a little body of ore near the city limits of Birmingham. Active development of the ore beds will begin at once.

BRITISH IRON MARKET

Increased Consumption and Favorable American Reports Cause Improvement.

Office of THE IRON TRADE REVIEW,
Prince's Chambers, Corporation St.,
April 8.

The pig iron market has experienced a decided recovery during the week. As far as Cleveland is concerned, this has been largely due to better American reports, but in the Midlands the improvement is still more marked, and is apparently due mainly to the enormous local consumption. The principal feature of Cleveland is the rapid reduction of stores. For example, yesterday, the business transacted amounted to 16,000 tons. On Tuesday last, the amount reported in store at Middlesboro was 473,367 tons. Yesterday, this had been reduced to 457,819 tons. There have been some fluctuations during the week, but yesterday's cash price for Middlesboro iron was £2 13s 10½d ($13.19) as compared with £2 13s 2d ($13.02) on Tuesday last. Advance in wages both in the finished and blast furnace departments of 2½ per cent this week have further strengthened the market. Midland consumers are now generally renewing their contracts, many buyers placing orders for 500-ton and 1,000-ton lots. Northamptonshire prices range from £2 17s 0d ($13.94) to £2 18s 0d, and Derbyshire £2 18s 0d ($14.20.) to £3 ($14.68.) A most material factor in prices is the dearness of coke which has advanced from ½ to 1s 6d on the week with supplies extremely scarce. Some furnaces are actually in difficulties for fuel at the present moment and the approaching advance of 5 per cent in colliers' wages promises further difficulties in the same direction. A significant circumstances is the advance of 2s per ton which took effect yesterday in the price of coke and breeze made at the Birmingham Gas Works. This kind of coke is of no use for iron smelting, being too friable and lacking in body and solidity, but the advance shows very decidedly the state of the coke market. Generally speaking, prices are now tending upwards.

METAL MARKET.

NEW YORK.

April 16.

Copper.—The market continues one of uncertainty, with the future largely dependent upon developments abroad. If it turns out that the sharp and sweeping decline in London has been brought about merely by manipulation, a renewal of buying by consuming interests will soon force the price back to the American level; if this foreign decline is based upon a legitimate decrease in demand, the disparity in prices will permit of the importation of standard to this country for refining here. The largest American producers are holding out for the equivalent of 25c for electrolytic, but the moderate selling that is being done is on the level of 24c. Current quotations are as follows: Lake 25c to 25½c; electrolytic, 24c to 24½c; casting, 22½c to 23½c. The London situation has improved slightly, spot standard closing yesterday at £94 5s.

Pig Tin.—The tendency is downward and inquiry is exceedingly small, while current sales include no large tonnages. For spot delivery 40.20c was bid yesterday on the Metal Exchange, 40c for April and 39½c for May. The spot market in London closed yesterday at £184 5s. Since April 1 total receipts from abroad have been 1,548 tons, with slightly more than 2,100 tons afloat.

Pig Lead.—Spot is held at 6.00c, to 6.05c, with the demand light and business unimportant. Soft Missouri is held at 5.95c. Soft Spanish closed yesterday at £19 17s 6d on the London market.

Spelter.—In carload lots for spot shipment refined is quoted at 6.75c to 6.80c, with the market barely steady. St. Louis quotes 6.60c to 6.65c for May to spot. G. M. B closed yesterday in London at £25 15s.

Antimony.—Spot quotations follow: Cookson's, 23c to 23½c; Hallett's, 21c to 21½c; ordinary brands, 20½c to 21c.

CHICAGO.

April 15.

Small sales in metals continued to be the rule during the past week. Railroads and other large buyers still made small purchases sufficient only for their current needs. The only change in price apparent was a falling off of a cent in the price of copper, a reflection of the London market.

Copper lake dropped from 27c to 26c and casting from 26¾c to 25½c and 26c. Pig tin sold for 43c and 43½c according to the quantity bought. Sheet zinc was quoted at 8.50c La Salle in car lots of 600-pound casks. Spelter sold for 7¼c. Lead desilverized sold between 6.50c and 6.60c for 50-ton lots and corroding between 7.25c and 7.35c. For carload lots 2½c per 100 pounds more was demanded. Cookson's antimony was quoted at 28½c, other grades were 26c.

Continued depression in the buying price of old metals because of the uncertain conditions was the rule, a fall of ½c was apparent in most metals.

Buyers' prices quoted were: Copper wire, 18.50c to 19c; heavy copper, 18c; copper bottoms, 17.50c to 18c; copper clips, 18c to 18.50c; red brass, heavy, 17c to 17.50c; yellow brass, heavy, 14.50c to 15c; red brass, borings, 15c to 15.50c; yellow brass, borings, 13c to 13.50c; light brass, 12c; pipe lead, 5.25c; tea lead, 5c; zinc, 5c; tinfoil, 32c; pewter No. 1, 27c.

ST. LOUIS.

April 15.

Shipments and prices of lead and zinc in the Joplin district show a heavy weekly gain over last year the shipment for the week just ended marking an increase of 1,296 tons zinc and 481 tons lead. The total increase for the year to date aggregates 16,489 tons zinc and 3,628 tons lead, at an increase in value of $1,409,000 over the corresponding week of 1906.

Prices for lead and zinc are $4 per ton higher than a year ago. The highest price paid for zinc was $53 a ton on an assay of $48 to $50 a ton of 60 per cent zinc.

Will Manufacture Wheels. — The Noiseless Car Wheel Co., with a capital of $1,000,000, has been organized with headquarters at Detroit and will manufacture a noiseless car wheel for street railroads. The directors are: George H. Bryant, August Ziesling, Bethune Duffield, J. L. Carleton, and Fred M. Delano. The officers are: George H. Bryant, at present western representative of the Krupp Co., president; August Ziesling, president of the American Bridge Co., vice president; Bethune Duffield, Detroit, treasurer, and W. F. McCorkle, Detroit, secretary. The wheel has been in use on one of the most important interurban roads in this country. It is made in two parts, the center and the tire. These are bolted together with a heavy cloth cardboard packing between them, and the construction of the wheel is such as to reduce the noise made by the street cars to so great an extent that it is no longer objectionable on the roads running on the main thoroughfares of the city. The wheel is also said to possess great economic value and that when the tread of a tire flats or a flange breaks, the tire can be removed and a new one adjusted without moving the center, which will endure as long as the axle.

PERSONALS.

John W. Seaver, one of the founders of the Wellman-Seaver-Morgan Co., Cleveland, with which he has been connected until within a few days, has severed his active connection with the company and opened offices as consulting engineer at 519 Caxton building, Cleveland. He will give his personal attention to the design and construction of manufacturing and power plants, buildings, iron and steel foundries, special cranes and special appliances for handling machinery.

Edwin F. Carry, of Chicago, has been chosen first vice president of the American Car & Foundry Co., St. Louis, to fill the vacancy caused by the resignation of W. J. McBride. Mr. Carry was promoted from the second vice presidency of the company. Mr. McBride will take up the management of the properties of the Haskell & Barker Car Co.

Site is Purchased.—The Calumet Steel Co., whose organization was recently announced has purchased land for the erection of a plant in Chicago Heights, Ill. The ground purchased consists of 15 acres valued at $60,000. It was bought from the Chicago Heights Land Association. The plant upon which work will begin at once will comprise a main building, and office 80 x 900 feet; machine shop, 75 x 150 feet; boiler house, 60 x 100 feet; engine room, 50 x 100 feet, and warehouse 150 x 400 feet. The cost of the plant will approximate $300,000. Work on the machine shop will be completed first. The entire plant is expected to be ready for operation by Oct. 1, 1907.

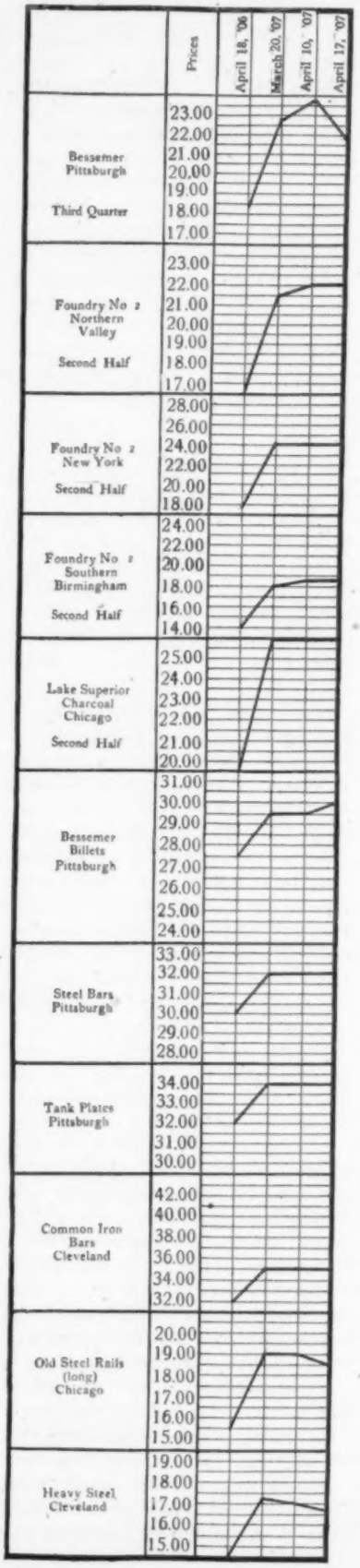
EXAGGERATED REPORTS.

Many reports of great damage to the wheat crop in several states have recently been circulated. On this subject, the Cincinnati *Price Current* of Thursday will say:

"No one questions that damage has occurred, and that it may widen in extent. But whatever the future may develop, the situation at this time does not justify a very serious lowering in the general average condition of the winter wheat, in comparison with the official indication for April 1, and it may with confidence be accepted as still better than the average for April 1 for the past ten years."

PRICE CHART CHANGES.

The lines of our price chart this week apparently indicate a decline in Bessemer pig iron. This is not true, however, as the quotation for some time past has been for second quarter delivery, while this week we quote for third quarter. The quotation of $34 for tank plates is nominal, as all the interests selling at present are obtaining considerably higher prices.


Prices
April 18, '06
March 20, '07
April 10, '07
April 17, '07
Bessemer Pittsburgh Third Quarter
23.00 22.00 21.00 20.00 19.00 18.00 17.00
Foundry No 2 Northern Valley Second Half
23.00 22.00 21.00 20.00 19.00 18.00 17.00
Foundry No 2 New York Second Half
28.00 26.00 24.00 22.00 20.00 18.00
Foundry No 2 Southern Birmingham Second Half
24.00 22.00 20.00 18.00 16.00 14.00
Lake Superior Charcoal Chicago Second Half
25.00 24.00 23.00 22.00 21.00 20.00
Bessemer Billets Pittsburgh
31.00 30.00 29.00 28.00 27.00 26.00 25.00 24.00
Steel Bars Pittsburgh
33.00 32.00 31.00 30.00 29.00 28.00
Tank Plates Pittsburgh
34.00 33.00 32.00 31.00 30.00
Common Iron Bars Cleveland
42.00 40.00 38.00 36.00 34.00 32.00
Old Steel Rails (long) Chicago
20.00 19.00 18.00 17.00 16.00 15.00
Heavy Steel Cleveland
19.00 18.00 17.00 16.00 15.00

JUDGE GARY'S VIEWS

On Needed Reforms, Concentration of Wealth and Other Subjects.

A notable interview with Judge Elbert H. Gary, chairman of the board of directors and also of the finance committee of the United States Steel Corporation, was published last Sunday by a syndicate of the leading newspapers of the country. The interview was obtained by the well-known and brilliant journalist, James B. Morrow, by whom it was copyrighted and by whose kind permission we are enabled to publish a synopsis. In the beginning of the interview Judge Gary said:

"No doubt franchises have been given away when they should have been sold and the money put into the public treasury.

"No doubt some of our banks have manipulated the currency of the country, making it dear or cheap, to affect values in Wall street.

"No doubt directors and officers of large corporations have withheld information about dividends that they might speculate in the shares of their own companies.

Must be Stopped by the Rich.

"All this must be stopped by the rich themselves, or the mob may stop it. There must be more honesty and a higher sense of duty among the financiers of the country. There will be. In fact, the reformation has begun. And let me say that Theodore Roosevelt has been tremendously influential in creating a sound and vigorous public opinion, and in compelling dishonesty to keep within the law and the elementary decencies of business. I know it is said he is fighting capital. He is not. His war is against wrong, and every good man should sustain him."

"Suppose," said Mr. Morrow, "the directors of the United States Steel Corporation had informally decided to resume payment of the dividends on their common stock, what would prevent them from speculating in it before the news was announced?"

"Plain, everyday honesty," replied Judge Gary. "I am obliged to you for asking that question. It affords me the opportunity of making public some things which ought to be known. In the first place, we believe in publicity. Shareholders may always get the facts if they come here. At the end of every quarter, we prepare a statement fully covering the business which has been done. I write it, in this very room, and never before the morning of the day when the directors are to meet. After it has been read to the directors, it is held until the stock exchange is closed. Then it is sent to the newspapers.

"But let me give a direct answer to your question. Undoubtedly a few men, and you can name them over on the fingers of one hand, could informally agree to begin paying dividends on our common shares. In a meeting of the directors they would be listened to and their recommendation unquestionably would be followed.

"That these several men might in advance decide upon a dividend is a possibility. That they would go into the market and use their knowledge for personal profit, however, is an inconceivable conspiracy against the stockholders of the corporation and the public generally. If any one of them should speculate in steel shares, knowing what the directors were likely to do, he would be ostracized by the rest and there would be serious troubles within the management."

Judge Gary expressed his conviction that the centralization of capital into great corporations is tending to prevent the extreme business depression of past years. "I maintain," he said, "that we have given permanancy to the most important industry of the country; that we have minimized individual failures; that we have kept men at work during good times and bad, and that we have steadied business generally."

Value of Corporation Properties.

Asked as to the alleged overcapitalization of the corporation, Judge Gary said that before the arrangement with James J. Hill was made to lease the ore lands of his railroad, the corporation had 1,200,000,000 tons of ore which it owned outright. "We pay Mr. Hill," said Judge Gary, "85 cents a ton royalty and increase the price to him from year to year. If his ore is worth 85 cents a ton, our ore, which is better in all respects, is worth $1. So I value the ore which we own at $1,200,000,000. The capital of the Steel Corporation is $1,400,000,000." Continuing, Judge Gary said that the coal lands of the corporation are worth $120,000,000; the coke ovens and mining equipment, $100,000,000, and mills and furnaces, $400,000,000. He estimated the actual cash value of all the property of the corporation at considerably more than $2,000,000,000. "In a short time," said he, "officers of the United States government will make a report in respect to our capitalization and our assets. We opened our books to them and gave them every means to get accurate information. I do not know what they will put down in their report, but if they don't say $1,400,000,000 is a just and rational capitalization, I shall be greatly chagrined and surprised."

Judge Gary gave an interesting account of the organization of the Federal Steel Co. In conclusion, he said:

"While we were engaged in getting the Federal company together, Mr. Morgan sent for me. He said he had talked with Marshall Field, Mr. Flower, and others, and that I had been decided on for president. I was making $80,000 a year in Chicago at my profession, having annual retainers of $35,000, I had clients whom I had served for many years, and to whom I was much attached. Moreover, I didn't see how I could tear my home to pieces and move to New York. 'I can't take the place' I told Mr. Morgan.

"'Why?'" he asked in his brusk way.

"I gave him my reasons, 'Well,' he replied, 'we expect to pay you for coming here.' I signed a contract for three years, refusing a longer period. I wasn't rich, but I had been economical, and was independent. I liked my Chicago friends and business and fully expected to return to that city, but I have been here ever since."

OBITUARY.

John A. Kebler, general manager of the coal operating department of the Colorado Fuel & Iron Co., died at Trinidad, Colo., April 12, from ptomaine poisoning. Mr. Kebler was about 45 years of age. His death makes the sixth that has occurred in the last two years among the officials of the Colorado Fuel & Iron Co.

General Eugene Griffin, first vice president and manager of the sales department of the General Electric Co., died at his apartments in the Mohawk club, Schenectady, N. Y., April 11, without recovering consciousness from apoplexy, with which he was stricken shortly before midnight. His age was 52. General Griffin was a graduate of the West Point Military Academy and remained in the service of the government for a number of years until he became general manager of the railway department of the Thomson-Houston Electric Co. In 1892 he was elected first vice president of the General Electric Co., and in 1893 president of the Thomson-Houston International Electric Co., director of the British Thomson-Houston Co. and of the Cie. Francais pour l'Exploitation des Procedes Thomson-Houston, of Paris.

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SAN FRANCISCO'S NEEDS.

The illustration elsewhere in this issue of the first steel frame building to rise from the debris of San Francisco, almost a year after the disaster, is interesting in view of the early estimates of the tremendous tonnages of structural materials which would be required immediately for the rebuilding of that city. This view of the situation speedily gave way to the more conservative opinion, that while eventually a vast amount of steel and other building materials would be consumed, there would be practically no demand for a considerable period, while the city was groping about the ruins, reorganizing its demoralized activities and clearing the way for the great work before it, and that its purchases would extend over so long a period that no additional steel producing capacity would be necessary.

In an editorial published in THE IRON TRADE REVIEW of May 3, 1906, we said:

> The proposition to remove the duty on structural shapes to be used in the rebuilding of San Francisco will meet with little favor except among radical free traders. While it is true that the demand for structural material in this country is strong, and that the mills are well supplied with orders, the tonnage which is likely to be needed in California this year can easily be taken care of by the mills in this country. It is not probable that more than 50,000 tons of structural material, enough to erect 25 very large buildings, will be required by San Francisco for a year, while the production of structural shapes for 1906 promises to be about 1,500,000 tons.

This view has been fully justified and the occasional orders for structural steel, though totaling a considerable tonnage, have been filled with ease and expedition. It was to be expected, however, that a calamity of such sweeping proportions would carry in its trail a very general disarrangement of industrial conditions, and it is from this that San Francisco and the entire Pacific coast is now suffering. In the months immediately following the fire, when an army of men was needed to tear down tottering walls and clear the streets, the greatest scarcity was of men. Laborers and skilled workmen alike were hard to secure and the situation was rendered more acute by reason of the arrogant attitude of certain labor unions. At the same time, traffic conditions were in thoroughly bad shape and for some months the inability to transport materials to the district proved a stumbling block in the way of those ready to begin the work of rebuilding.

In course of time, however, both of these important difficulties were largely overcome and today they are the subject of little concern. They have given place, in considerable degree, to a pronounced shortage of the more bulky kinds of building materials, which under ordinary circumstances would be manufactured near the point of consumption. Contractors in San Francisco, for instance, are unable to secure anything approaching the needed amount of cement, which in the form of reinforced concrete or concrete blocks offers a cheap and rapid method of constructing the smaller buildings, and it is stated that all the mills of the coast can not meet the demand. The same holds good of fire brick and of similar materials. The foundries of the city and district are swamped with imperative orders far beyond their ability to fill.

Some relief is being afforded through the low rates of incoming marine freights at this point. Many vessels which have been accustomed to enter the San Francisco harbor light are now carrying as ballast cement and brick, tin, pig iron for the foundries and other bulky materials. In addition, as there is every indication that the demand will continue well into the future, the field is certain to tempt manufacturers and attract new and larger industries. There is evidence that this movement has already set in.

ACID OPEN-HEARTH STEEL IN ENGLAND.

The British Iron Trade Association has returned statistics of the make of Bessemer and open-hearth steel in England in 1906. Details are given elsewhere in this issue. The make of ingots last year was as follows, in gross tons:

	Acid.	Basic.	Total.
Bessemer	1,307,149	600,189	1,907,338
Open-hearth	3,378,691	1,176,245	4,554,936
Total.....	4,685,840	1,776,434	6,462,274

The total of open-hearth steel shows a gain of 700,000 tons over 1905, which year broke the record made in 1901. In Bessemer steel no new production record was made, but the 1906 total is not far behind the best tonnages shown in previous years.

The distribution as to acid and basic linings is quite different in England from what it is in the United States. In this country we make no basic Bessemer steel, and have made very little in the past, and are not likely to employ the process in the future. In England nearly one-third the Bessemer steel product in 1906 was made by the basic process, the proportion being not greatly different from that shown in previous years.

That practice, however, is due to choice only in the sense that ores are chosen. Pig iron suitable for the basic Bessemer process cannot well be made into steel in any other manner. In the manufacture of 3,378,691 tons of acid open-hearth ingots, more than one-half the total steel production, there was choice exercised, as the pig iron used could have been employed in the acid Bessemer converter. In the United States a contrary choice has been made; our acid open-hearth industry has grown very little, the pig iron being employed rather in the acid Bessemer converter. Only about one-eighth of our open-hearth steel is made by the

acid process; in England the proportion in 1906 was three-fourths.

Our cousins across the water, however, appear to be feeling the pinch of ore dictation to an extent. The increase in acid open-hearth steel from 1905 to 1906 was 336,000 tons; the increase in basic open-hearth steel was 381,000 tons. Such a swing has been going on for several years, the make by the basic process increasing more rapidly in tons, and much more rapidly in per cent, than by the acid process. Only three years earlier, in 1903, the make by the basic process was but one-sixth of the total open-hearth production; in 1906, with a total about one-half larger, the proportion had risen to one-fourth. Everywhere, it appears, the need for phosphorus elimination is growing, as low phosphorus ores become scarcer.

THE MARCH OF OPEN-HEARTH STEEL.

The official statistics of open-hearth steel production in the United States in 1906 show a gain of practically 2,000,000 gross tons over 1905 and more than 5,000,000 tons over 1904, although that year held the record at the time. This is a wonderfully rapid advance, and due almost wholly to the increased use of the basic process, as of the 1906 open-hearth steel production only 12 per cent was made by the acid process.

In these latter days the advance of basic open-hearth steel has surpassed the advance made in the earlier years which in its time was regarded as so remarkable. In 1897 the production of basic open-hearth steel first passed the million-ton mark, with 1,056,043 tons. In not one year has the production failed to establish a new record. The growth from 1,056,043 tons in 1897 to 5,106,367 tons in 1904, showed a stupendous advance in percentage in seven years, but for production to increase to 9,649,385 tons in the two succeeding years, almost doubling, is still more remarkable.

The comparison of the 1906 statistics with those for 1905 for open-hearth ingots and castings, in gross tons, is as follows:

	1905.	1906.
Basic	7,815,728	9,649,385
Acid	1,155,648	1,321,613
Total	8,971,376	10,970,998
Ingots alone ..	8,444,836	10,257,841
Castings alone	526,540	713,157

In discussing the Bessemer steel statistics in THE IRON TRADE REVIEW of March 21 the open-hearth production in 1906 was estimated at 10,750,000 tons, or 2 per cent less than the official statistics now show. Estimating that the production of crucible and miscellaneous steel will be about 120,000 tons, showing a slight gain over 1905, and approximating the record production of these classes of steel made in 1902, the total production of steel ingots and castings in the United States in 1906 may be taken as having been 10,000 tons either way from 23,365,000 gross tons.

Anticipations held for years by the friends of the basic open-hearth process, that its production will pass that by the Bessemer process, are destined to be realized in 1908. In 1905 the open-hearth production lacked 1,870,000 tons of equalling the Bessemer production; in 1906 it fell short by only 1,300,000 tons. The present year may slightly lessen the gap, but cannot do much. The last new Bessemer steel plant built, that at Youngstown, came in after the middle of 1906 had been passed, but will produce for the entire year 1907. Against it are some increases in open-hearth capacity, made in the second half of 1906, and being made in this first half of 1907, but not enough to make a great swing.

With 1908, however, the competitive conditions between the two processes will have been greatly altered. The standard Bessemer plant at Duquesne will have been dismantled, taking out a rated capacity of 600,000 tons of ingots a year, while in open-hearth there will be the 18 furnaces at Duquesne, the 12 at Youngstown, and the 56 at Gary, all either in operation at the beginning of the year or at least in position to make a large contribution to the year's total. These furnaces, with other smaller additions, will give about 4,000,000 tons of annual capacity, which should certainly contribute 2,500,000 tons to the 1908 production. With the loss of 600,000 tons at Duquesne, partly made up by a continuance of the increase in production at old Bessemer plants, there will be a big swing towards open-hearth in 1908, and it may be said, broadly speaking, that while in 1905 open-hearth production fell short of Bessemer production by 1,870,000 tons, in 1906 by 1,300,000 tons, and will probably fall short by some similar amount in 1907, it will exceed Bessemer production in 1908 by something like 1,500,000 tons. That, indeed, would show a heavier production by the basic open-hearth process alone than by the Bessemer process.

SHIPPING CONDITIONS

Will Be Thoroughly Investigated by New England Foundrymen's Association.

The regular monthly meeting of the New England Foundrymen's Association was held at the Exchange Club, Boston, Wednesday, April 10. The committee appointed at the last meeting of the association to investigate the matter of shipping conditions, particularly in regard to obtaining redress on short weights in shipments of pig iron, coal and coke, reported it had held one meeting, but as the committee consisted entirely of local members, it was thought best to increase the committee to 15, and that the same be selected from different parts of New England in order that the committee might have a larger field to work from and be in a position to get more definite information in regard to the conditions existing in that section of the country. The chair appointed ten additional members and the full committee is as follows:

Jas. L. Anthony, chairman, Weir Stove Co., Taunton, Mass.
Wm. J. Breen, secretary, Hugh W. Adams & Son, Taunton, Mass.
Walter B. Snow, B. F. Sturtevant Co., Hyde Park, Mass.
Lewis E. Harper, Becker-Brainard Milling Mach. Co., Hyde Park, Mass.
Henry F. Arnold, American Tool & Machine Co., Hyde Park, Mass.
Henry A. Carpenter, A. Carpenter & Sons Fdy. Co., Providence, R. I.
B. M. Shaw, Walker-Pratt Mfg. Co., Watertown, Mass.
W. A. Jackson, Walworth Mfg. Co., Boston, Mass.
Chas. J. Caley, Russell & Erwin Mfg. Co., New Britain, Conn.
John F. Keyes, Reed Foundry Co., Worcester, Mass.
A. A. Brown, General Electric Co., Lynn, Mass.
Chas. F. Hildreth, Whitcomb Foundry Co., Worcester, Mass.
C. L. Prince, H. B. Smith Co., Westfield, Mass.
Chas. L. Newcomb, Deane Steam Pump Co., Holyoke, Mass.
C. R. Brown, Saco-Pettee Machine Shops, Newton Upper Falls, Mass.

Announcement was made that the next meeting of the association would be held in Boston on May 8, and that the executive committee had arranged with Roy U. Conger, New York, who will read a paper on "Scientific Salesmanship."

After a short intermission the meeting adjourned to dinner after which the president introduced as the speaker of the evening, Edwin A. Moore, president of the American Coke & Gas Consumption Co., Camden, N. J., who spoke on the subject: "By-products, Coke, Etc." His remarks were closely followed by the members and a brief discussion followed.

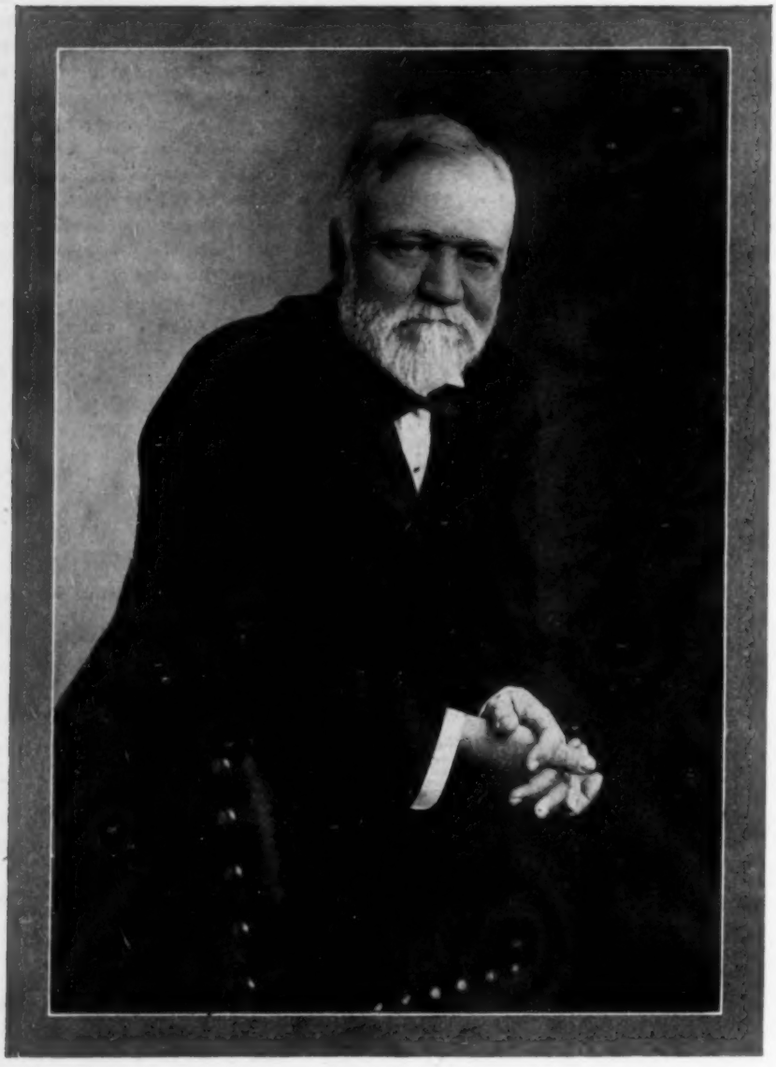
GREAT ENGINEERING BUILDING DEDICATED.

CO-OPERATION WAS KEYNOTE OF MR. CARNEGIE'S ADDRESS.

In Any Enterprise for Good, he Said, There is Always Consolidation.—Simple and Impressive Exercises.

(Special Telegram.)

New York, April 17.—Simple, sincere and impressive, the exercises dedicating the Engineering Societies building Tuesday and Wednesday of this week were thoroughly in accord with the ideas of both donor and building committee and bespeak the same spirit which has made the dominant feature of the structure its quiet, unostentatious elegance. The wide auditorium and galleries were well filled when, shortly before the hour set for the exercises to begin, the first public test of the remarkable illumination was made. A pale light first flickered through the great room, then grew stronger and finally flooded every corner. There was hearty cheering when the platform chairs were occupied, and more cheers when John Fritz, down in the auditorium, rose to change his location.



ANDREW CARNEGIE.

At the exercises Tuesday afternoon, the following program was carried out:

Music . . . . . "Largo" . . . . . *Haendel*
Richard Arnold Double Quartette.
Opening—Charles Wallace Hunt, Presiding Officer. The first use as a gavel of the setting maul employed by Mrs. Carnegie in laying the corner stone of the building.
Prayer by the Rev. Edward Everett Hale, Chaplain U. S. Senate.
Communications from the President of the United States; the President of the Republic of Mexico; the Governor General of Canada.
Historical Address by Charles F. Scott, Chairman of the Building Committees.
Acceptance of the Building by E. E. Olcott, President of the United Engineering Society, representing the Founder Societies.
Address by Andrew Carnegie, the Donor of the Building.
Music . . . . "Traumerei" . . . . *Schumann*
Cello Solo, Kronold.
Oration by President Arthur T. Hadley, of Yale University. "The Professional Ideals of the Twentieth Century."
Music . . . "Hallelujah Chorus" . . . *Haendel*

When Charles Wallace Hunt called the meeting to order, it was discovered that the historic maul, with which it was expected to open the proceedings, had been too securely put away, but arrived shortly after. President Hunt's introductory remarks were followed by invocation by the venerable Edward Everett Hale, the entire audience joining in the Lord's prayer at its close. Thomas C. Martin read the message of greeting from President Roosevelt.

President Roosevelt's Message.

The White House,
Washington,
April 13, 1907.

My Dear Sir:

I heartily congratulate you on the opening of the building of the Engineering Societies. The building will be the largest engineering center of its kind in the world. It is indeed the first of its kind, and its erection in New York serves to mark and emphasize the supremacy which this country is steadily achieving through her proficiency in applied science. The whole country is interested in the erection of such a building, and particularly, of course, all of those who follow either the profession of engineering or any kindred profession; and in no branch of work have Americans shown to greater advantage what we like to think of as the typically American characteristics.

With all good wishes, believe me,
Sincerely yours,
Theodore Roosevelt.

Mr. T. C. Martin,
114 Liberty street,
New York, N. Y.

The Mexican ambassador conveyed the greetings of his president and Mr. Martin explained that a delayed train kept the Canadian representative from the gathering.

Mr. Scott's Address.

The historical address of Chas. F. Scott reviewed the history of the building and eloquently dwelt upon the significance of the societies having a common home. It will be published in full in

next week's issue of THE IRON TRADE REVIEW.

Mr. Carnegie's Address.

In opening his address, Mr. Carnegie said:

"There is a Scotch saying, and many Scotch sayings are wise, that only fools and bairns will see a thing half done. I do not want to be associated with either class and must conclude that the same should be true of donors."

He then told of the dedication at Pittsburg last week of the Carnegie institute, which he described as a palace, a dream in architecture at which he wondered and could not realize his part in it.

"The safety of society," continued Mr. Carnegie, "lies in the fact that in any enterprise for good there is always consolidation and co-operation, while in the attempt at bad there is none of this. No one can trust another. All is well with us because all is growing better." He spoke of the fact that the architects of the building were two young men, practically unknown in their profession, though one was the son of Dr. Hale, sitting on the platform. This he cited as a splendid instance of American democracy. Co-operation and concertive action were the keynotes of his address. The American's advantage, he declared, lies in his ability and dispositon to co-operate. He referred to the fact that the great building committee had agreed unanimously on every point in connection with the structure, adding that this would never have been possible in Great Britain or Scotland.

"The older I get"—he corrected himself—"The younger I get, and the more experienced in men,—and women,—the more convinced I am that those we hate are only those we don't know. All men of all nations are really our brothers. All the engineering societies of America are really one band with headquarters here."

Wednesday's Exercises.

The second day's program was carried out as follows:

Introduction by J. W. Lieb Jr., Chairman of Dedication Committee.

Addresses by Presidents of Founder Societies—Dr. Samuel Sheldon, President A. I. E. E.; Dr. F. R. Hutton, President A. S. M. E.; Dr. John Hays Hammond, President A. I. M. E.

Greeting and Felicitations from Foreign and National Scientific Societies and Institutions of Learning.

Presentation of John Fritz Gold Medal to Dr. Alexander Graham Bell, by Charles F. Scott, Chairman John Fritz Medal Board of Award.

Presentation of Medals for Distinguished Services to R. W. Pope, Secretary A. I. E. E.; Dr. F. R. Hutton, Past Secretary A. S. M. E.; Dr. Rossiter W. Raymond, Secretary A. I. M. E., by Dr. A. R. Ledoux, representing the three Societies.

OPEN-HEARTH PRODUCTION

Increases Over Twenty-Two Per Cent in One Year.

The American Iron and Steel Association has just completed the collection of the statistics of the production of open-hearth steel ingots and castings in the United States in 1906.

Total Production.—The total production of open-hearth steel ingots and direct castings in the United States in 1906 was 10,970,998 gross tons, against 8,971,376 tons in 1905, an increase of 1,999,622 tons, or over 22.2 per cent. The production was much larger than in any preceding year, and was only 1,304,255 tons less than the production of 12,275,253 tons of Bessemer steel ingots and castings during the same year. The year of next largest production of open-hearth steel was 1905. When the collection of the statistics of the production of crucible and miscellaneous steel ingots and castings is completed it will be found that the total production of all kinds of steel ingots and castings in this country in 1906 approximated 23,365,000 gross tons. The following table gives the production of open-hearth steel ingots and castings by states since 1903, in gross tons.

States—Gross tons.	1903.	1904.	1905.	1906.
New England	169,209	195,901	239,282	251,047
N. Y. and N. J.	104,598	165,986	348,072	553,186
Pennsylvania	4,442,730	4,306,498	6,471,818	7,710,949
Illinois	422,919	358,215	617,625	884,472
Ohio	369,349	480,906	687,392	816,483
Other States	321,106	400,660	607,187	754,861
Total	5,829,911	5,908,166	8,971,376	10,970,998

Active Works.—The open-hearth steel made in 1906, including both ingots and castings, was produced by 124 works in 20 states, as follows: Massachusetts, 4; Connecticut, 3; Rhode Island, 1; New York, 8; New Jersey, 5; Pennsylvania, 61; Delaware, 1; Maryland, 1; West Virginia, 1; Georgia, 1; Alabama, 5; Ohio, 13; Indiana, 3; Illinois, 7; Michigan, 2; Wisconsin, 4; Missouri, 1; Minnesota, 1; Colorado, 1; and California, 1. West Virginia, Georgia, and Minnesota, neither of which made open-hearth steel in 1905, appear among the producers in 1906. One hundred and eleven works in 17 states made open-hearth steel in 1905, and 116 works in 16 states made open-hearth steel in 1904.

Basic and Acid Steel.—In 1906 there were 9,649,385 tons of open-hearth steel made by the basic process, and 1,321,613 tons by the acid process, while in 1905 the production by the basic process amounted to 7,815,728 tons and by the acid process to 1,155,648 tons. This is a gain in production in 1906 over 1905 by the basic process of 1,833,657 tons and by the acid process of 165,965 tons. In 1904 there were made 5,106,367 tons of open-hearth steel by the basic and 801,799 tons by the acid process.

The accompanying table gives the production by states of both basic and acid open-hearth steel ingots and castings in 1905. Pennsylvania made 68.4 per cent of the total production of basic steel ingots and castings in 1906 and 83.6 per cent of the total production of acid steel ingots and castings, against 70.3 per cent of basic and 84.1 per cent of acid ingots and castings in 1905. Illinois and Ohio were the next largest producers of open-hearth steel in each of these two years. The production of basic and acid open-hearth steel was first separately ascertained by the American Iron and Steel Association for the year 1896. Gross tons are used.

States—Gross tons.	Basic open-hearth steel.	Acid open-hearth steel.	Total. Gross tons.
New England	184,307	66,740	251,047
N. Y. and N. J.	520,422	32,764	553,186
Pennsylvania	6,605,912	1,105,037	7,710,949
Illinois	878,548	5,924	884,472
Ohio	755,936	60,547	816,483
Other States	704,260	50,601	754,861
Total	9,649,385	1,321,613	10,970,998

Ingots and Castings.—The production of open-hearth steel ingots in 1906, excluding castings, amounted to 10,257,841 tons, against 8,444,836 tons in 1905, an increase of 1,813,005 tons, or over 21.4 per cent. The production of castings alone in 1906 amounted to 713,157 tons, against 526,540 tons in 1905, an increase of 186,617 tons, or over 35.4 per cent.

Basic and Acid Ingots.—The accompanying table gives in gross tons the production of basic and acid open-hearth steel ingots in 1906 by states.

States—Gross tons.	Basic ingots.	Acid ingots.	Total Gross tons.
New Eng., N. Y., and N. J.	666,196	48,527	714,723
Pennsylvania	6,581,872	829,079	7,410,951
Ill., Ohio, and other States	2,095,563	36,604	2,132,167
Total	9,343,631	914,210	10,257,841

Basic and Acid Castings.—As already stated the total production of open-hearth steel castings in 1906 amounted to 713,157 tons, as compared with 526,540 tons in 1905. The production in 1906 was much the largest in our history. The year of next largest production was 1905. Of the total production in 1906 407,403 tons, or over 57.1 per cent, were made by the acid process, and 305,754 tons, or almost 42.9 per cent, were made by the basic process. As compared with 1905, when 320,381 tons of castings were made by the acid process, the increase in 1906 by this process was 87,022 tons. By the basic process the increase was 99,595 tons, the production by this process in 1905 having amounted to 206,159 tons.

The accompanying table gives the

production of open-hearth steel castings by both the basic and acid processes in 1906 by states, in gross tons.

States—Gross tons.	Basic castings.	Acid castings.	Total. Gross tons.
New Eng., N. Y., and N. J.	38,533	50,977	89,510
Pennsylvania	24,040	275,958	299,998
Ill., Ohio, and other States	243,181	80,468	323,649
Total	305,754	407,403	713,157

STEEL PRODUCTION OF THE UNITED KINGDOM.

The largest advance made in any one year since the open-hearth steel industry was founded in that territory, about 1865, is shown by the ouput of open-hearth steel ingots in the United Kingdom in 1906 as compiled by the British Iron Trade Association and published in the *Iron and Coal Trades Review*. The production reached the aggregate of 4,554,936 tons in 1906, as compared with 3,838,072 tons in 1905, a gain of 716,864 tons. The output in 1904 was 3,245,346 tons and 3,124,083 tons in 1903. In 1906 there was produced 1,176,245 tons of open-hearth basic steel ingots, as against 795,238 tons in 1905, an increase of 381,007 tons. The totals for 1904 and 1903 were 662,064 tons and 510,809 tons, respectively. In acid open-hearth steel production the figures were 3,378,691 tons in 1906, 3,042,834 tons in 1905, 2,583,282 tons in 1904 and 2,613,274 tons in 1903.

Decrease in Finished Steel.

In finished open-hearth steel the same proportion of gain was not maintained. The production of steel plates and angles was 1,734,446 tons in 1906, and 1,765,111 tons in 1905, a decrease of 30,665 tons; in steel bars and tin plate bars, 939,087 tons in 1906, and 839,415 tons in 1905, an increase of 99,672 tons; in steel blooms and billets, 498,656 tons in 1906, and 402,535 tons in 1905, an increase of 96,121 tons; in steel rails, 94,626 tons in 1906, and 108,953 tons in 1905, a decrease of 14,327 tons. In structural shapes the output in 1906 was 198,380 tons. The finished production totaled 3,465,195 tons, leaving 1,089,741 tons of ingots to be accounted for. Of this quantity, a considerable part was wasted in manufacture and the remainder is made up of tires and axles, forgings and castings, etc., of which complete returns have not been obtained.

Small Furnace Increase.

The returns collected in the spring of 1906 show that there were then 515 open-hearth furnaces erected in Great Britain, of which 383 had been in operation during 1905. In 1906 the average number of furnaces in operation was 419, while the total number of furnaces built shows a slight increase as compared with the previous year. The total average output of ingots per furnace in operation was 10,130 tons in 1905 and 10,871 tons in 1906. Of the total furnaces in operation last year 331 were employed in the acid process and 88 in the basic. Eighteen new furnaces were being constructed at the end of 1906, all but one being for the acid process, and 109 furnaces were either unemployed or were only occasionally employed in that year. The 331 acid open-hearth furnaces in operation in 1906 produced 3,378,691 tons, an average of 10,207 tons per furnace, and the 88 basic furnaces, 1,176,245 tons of ingots, an average of 13,366 tons per furnace.

Bessemer Output Falls.

A decerase of 66,872 tons was shown in the Bessemer steel ingot production in 1906 from that of 1905. The totals were 1,907,338 tons in 1906, 1,974,210 tons in 1905, 1,781,533 tons in 1904 and 1,910,018 in 1903. The Bessemer output was divided into 1,307,149 acid tons in 1906, 1,396,233 tons in 1905, 1,129,224 tons in 1904, 1,316,915 tons in 1903, and 600,189 basic tons in 1906, 577,977 tons in 1905, 652,309 tons in 1904 and 593,103 tons in 1903. A loss is also apparent in the output of Bessemer steel rails in 1906, when the total tonnage was 854,740 tons, as compared with 951,552 tons in 1905, 916,374 tons in 1904 and 1,061,441 tons in 1903, making a decrease of 1906 from 1905 of 96,792 tons. In the finished and semi-finished materials from Bessemer works, the total tonnage production was 1,620,187 tons in 1906, of which 82,246 tons was in general merchant steel, 277,845 tons in blooms and billets and 242,706 tons in blooms and bars.

The total number of Bessemer converters in operation throughout the United Kingdom in 1906 averaged slightly over 56, while an average of just under 12 were unemployed. The total of converters in the United Kingdom consists of 44 acid and 24 basic. Altogether there were 18 different works engaged in the manufacture of Bessemer steel in 1906.

Hibben & Co., Chicago, manufacturers of boiler tanks, stacks and sheet iron work state that their plant was not destroyed by fire recently, as reported. The flanging department constituting but a small part of the entire plant was all that was damaged, and it is stated that this building will be replaced at once by one constructed of brick and steel on a somewhat larger scale.

SOCIAL FEATURES

Will be Prominent at American Foundrymen's Convention.

Plans for the coming convention of the American Foundrymen's Association at Philadelphia are rapidly undergoing completion. At the regular monthly meeting of the Philadelphia Foundrymen's Association, March 3, Chairman Brown, of the general entertainment committee, reported that a vaudeville entertainment and smoker for the visitors will be given on Tuesday evening, May 21, at Lu Lu Temple. A shad dinner is also being planned for Thursday evening, May 23. Members of the committee in charge are arranging for visits to the various industrial plants and are promising some splendid features in this connection. The entertainment of the ladies will also be amply looked after and special diversions arranged for their benefit. A record in respect to the attendance at such conventions is expected to be established by the Philadelphia meeting in view of the interest being displayed generally by foundrymen. The elaborate exhibit of the Foundry Supply Association in the Second Regiment Armory is expected to excel all previous attempts in this line. At the present time 60 spaces in the armory and in the tent which will be erected adjoining have been taken and inquiries are still being received from prospective exhibitors.

At the meeting of the Philadelphia association, Charles J. Caley, New Britain, Conn., first vice president of the American Foundrymen's Association, announced that plans were about complete for the formation of a Brass Founders' Association at the convention.

Dr. Charles F. McKenna, of New York, presented the very interesting paper of the evening on "The Hazard of Explosives in Large Cities and Spontaneous Combustion," which he handled in great detail.

Capt. J. C. Colwell, commander of the cruiser Denver, made a short address on "The Possibilities of Making the League Island Navy Yard the Largest Naval Station in the World."

Twenty machinists of the Ralston Steel Car Co., Columbus, O., walked out recently because the company refused to pay the demands for an increase in wages from 30 to 35 cents an hour, a 10-hour day and 55 hours a week for night shift with time and a half for over time. The demands also limited the number of apprentices

THE REPUBLIC IRON & STEEL CO.'S NEW FURNACES.

A THOROUGHLY MODERN PLANT AT HASELTON.

Hand-filled and Skip-filled Stacks Side by Side to Test the Merits of Each Type.

On New Year's day of the present year, the Republic Iron & Steel Co. blew in its No. 3 Haselton furnace, the second of the two new furnaces which have been added to its Haselton furnace plant at Youngstown, O. No. 2 furnace of the same group was put in blast Oct. 4 of the preceding year.

Ground was broken July 2, 1905, for No. 2 furnace, but progress was delayed by reason of the fact that the erection of No. 3 furnace was decided upon Nov. 1 following, necessitating the revision of plans and the holding up of certain contracts applying on No. 2 furnace, in order that the work on both stacks could proceed in conjunction and that the changes rendered necessary by the increased plant could be made properly. The original plans for No. 2 furnace contemplated the construction of a single, hand-filled furnace with the simplest and cheapest bin system that could be designed; however, when it was decided to proceed at once with the construction of No. 3 furnace it was thought best to make the latter a skip-filled furnace, arranging No. 2 furnace and bins in such manner that it would be possible to change same from hand-filled to skip-filled if deemed advisable.

The additional output of these two new stacks gives the Republic company upwards of 55,000 tons of Bessemer pig iron per month, making it self-contained for present requirements, but in the event of future developments calling for more pig iron, plans have been made for the erection of two more stacks in connection with the present plant, without encroaching on the extensive holdings of the company, located on the south side of the river directly opposite its Haselton plant.

As shown in the plan view (in which the two new furnaces are indicated by full lines and the present No. 1 furnace in dotted lines), one of these proposed stacks will replace the present No. 1 furnace, which will be razed, and No. 4 will be built adjoining the new No. 1. The site of the furnace plant is a most admirable one. Located on a long tract of land along the Mahoning river and crossed by Dry Run Creek (the latter running through the center of the property at a right angle to the river and covered with a double arch concrete viaduct 350 feet long) but well above the highest water, it parallels and is directly connected with the five trunk lines entering the city, thus giving it exceptional railroad facilities.

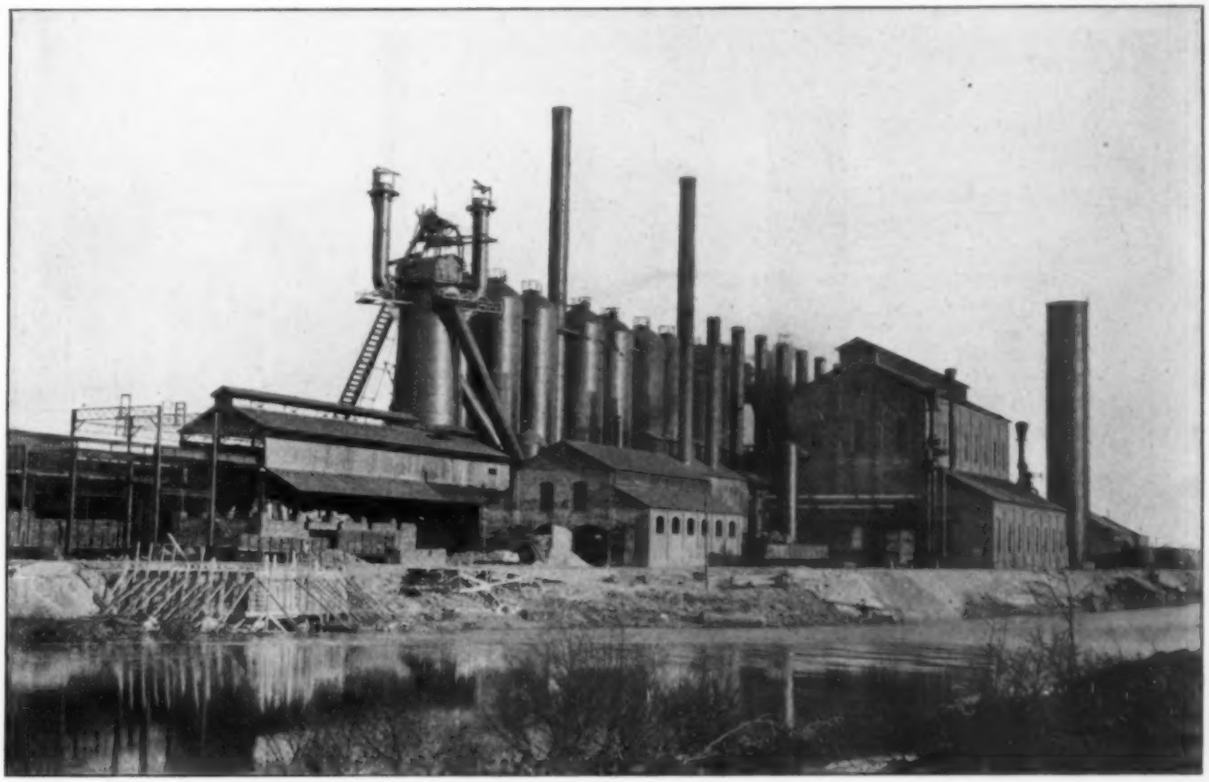


FIG. 1.—No. 3 STACK, HASELTON FURNACES, FROM WEST.

The Furnaces.

The two furnaces shown in the accompanying cuts represent all that is modern in blast furnace construction. No. 2 furnace, as shown in Fig. 3, is hand-filled, with the usual style of vertical hoist, but the system of bins does away with a large part of the labor commonly required for furnaces of this description. These bins are a part of the steel trestle, mention of which will be made later, and are so arranged

that the material is loaded directly into the charging buggies by gravity, which are in close proximity to the foot of the hoist, thereby saving the labor usually necessary to fill the buggies and the long haul from the various stock piles. This furnace has a bosh diameter of 19 feet 6 inches and is 85 feet high.

No. 3 furnace, shown in Fig. 1, is equipped with a Brown Hoist top and charging apparatus, including a Brown Hoist parabolic bin system with a single suspended larry charging car. The top mechanism is of the standard Brown Hoist construction, excepting that the bell has been suspended from a universal joint, thus insuring its seating itself at all times. The filling of this furnace is accomplished with one larryman, one skip operator and one laborer. It has a bosh diameter of 20 feet 6 inches, but is the same height as No. 2 furnace.

The gas washer shown is of the well-known Steece type with a modification designed and put in use by the Republic Iron & Steel Co. This is a device for the removal of scum from the interior of the washer. It consists of a vertical pipe terminating in a funnel, the mouth of which is level with the surface of the water in the interior of the washer. A horizontal pipe connects the vertical pipe supporting the funnel to a waste pipe, the horizontal pipe being swiveled so as to give a vertical rise and fall to the funnel. A system of floats on the exterior of the washer insures the funnel always maintaining a position coincident with the surface of the water. The scum forming on the surface is drawn out through this funnel and discharged to a pit from which the dust is removed by a yard crane.

Unusual Construction Details.

In connection with the two furnaces, eight stoves are used of the Kennedy center combustion type. These stoves are shown in cross-section in Fig. 7, and are symmetrical in design. Each stove is 22 feet diameter and 97 feet 10 inches high. They are divided into groups of four, each group having a self-supporting steel stack 8 feet 9 inches diameter and 180 feet high for taking care of the waste gases.

In connection with the stoves and furnaces, a number of unusually interesting details have been worked out. Every possible precaution has been taken to insure against a shut down of the furnaces on account of any ordinary accident. The steam lines, air lines, water lines, drains, etc., are in duplicate, and the piping is so arranged that either set of stoves can be worked in connection with either stack and any blowing engine or set of blowing engines can be used with either furnace. All the work is of the most substantial character and the possibility of a break down due to weakness has, as far as can be foreseen, been eliminated.

The bosh plates in the furnaces are arranged so that any one may be withdrawn at any time with a minimum of labor and without interfering with any other bosh plate or with the columns supporting the furnace. The bosh water is discharged through a drain in the foundation. There is, however, an auxiliary drain, normally closed with a four-inch brick wall, which can be broken down, if, for any reason, the main drain becomes stopped up. There is also a hot iron breakout in the foundation closed normally with a lead plate, which will melt at the first contact of hot iron and allow the iron to flow into the yard in the event of any emergency, thus avoiding clogging of the drains, and shutting down of the furnaces.

The furnaces, stoves and engines are supported on concrete and brick foundations, which are in turn built on piling driven 35 feet to 70 feet into the ground. The column supports and foundations of the furnaces are all faced with fire brick to obviate any possibility of their being melted in the event of a breakout or other accident whereby the molten iron escapes onto

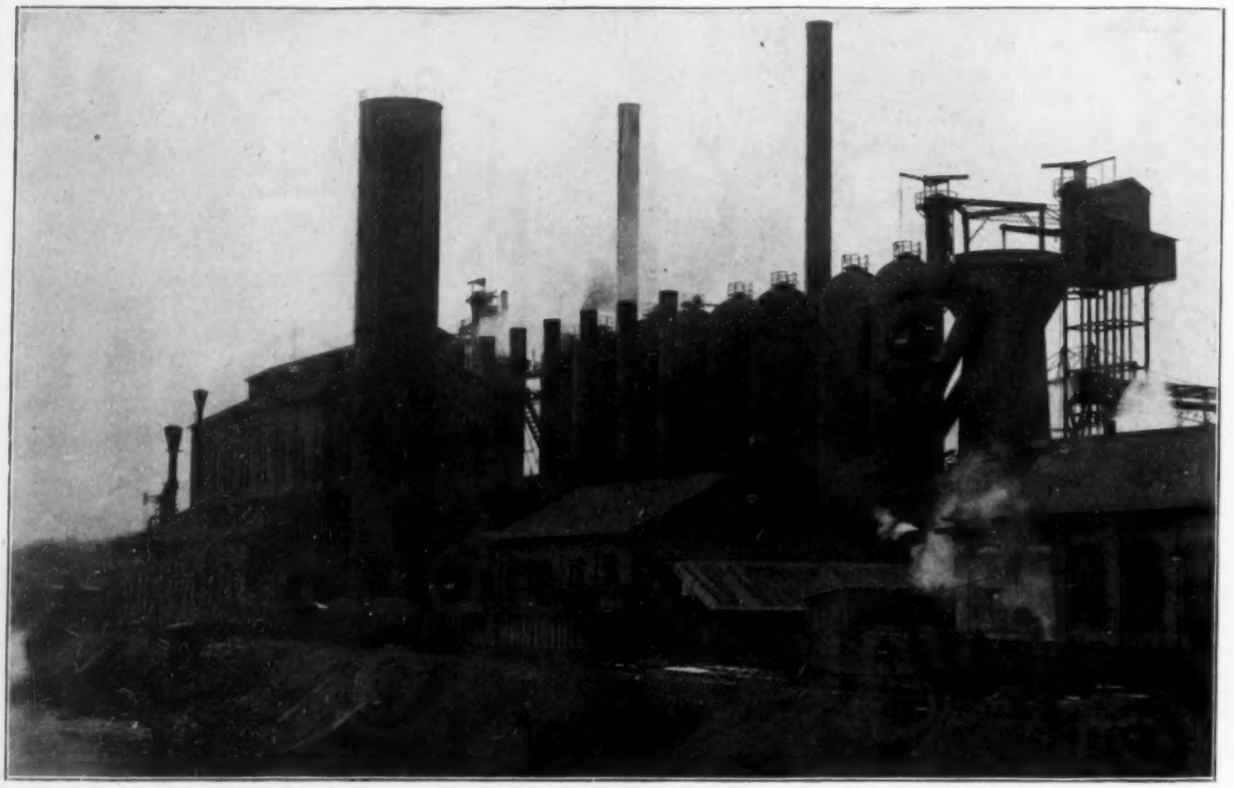
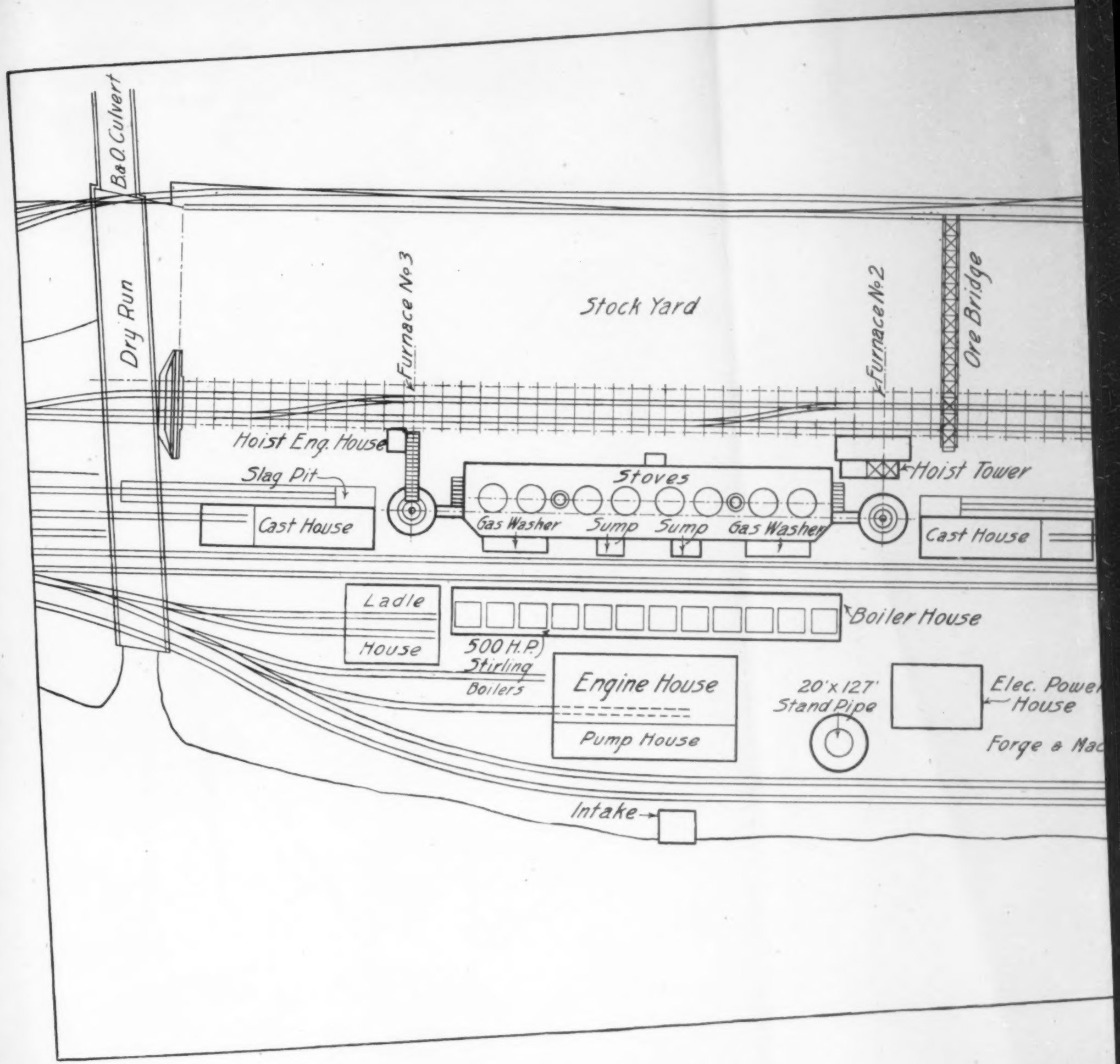


FIG. 2.—NO. 2 STACK, HASELTON FURNACES, FROM EAST.


B&O Culvert
Dry Run
Furnace No 3
Stock Yard
Furnace No 2
Ore Bridge
Hoist Eng. House
Slag Pit
Cast House
Stoves
Gas Washer
Sump
Sump
Gas Washer
Hoist Tower
Cast House
Ladle
House
500 H.P.
Stirling
Boilers
Boiler House
Engine House
Pump House
20'x 127'
Stand Pipe
Elec. Power
House
Forge & Mac
Intake

Property Line

Ore Bridge

t Tower

t House

e

Elec. Power House

Forge & Machine Shop

Store House

Office

Present No 1 Fce

Proposed Furnace

Slag Pit

Cast House

500 H.P. Stirling Boilers

Labratory

Pump House

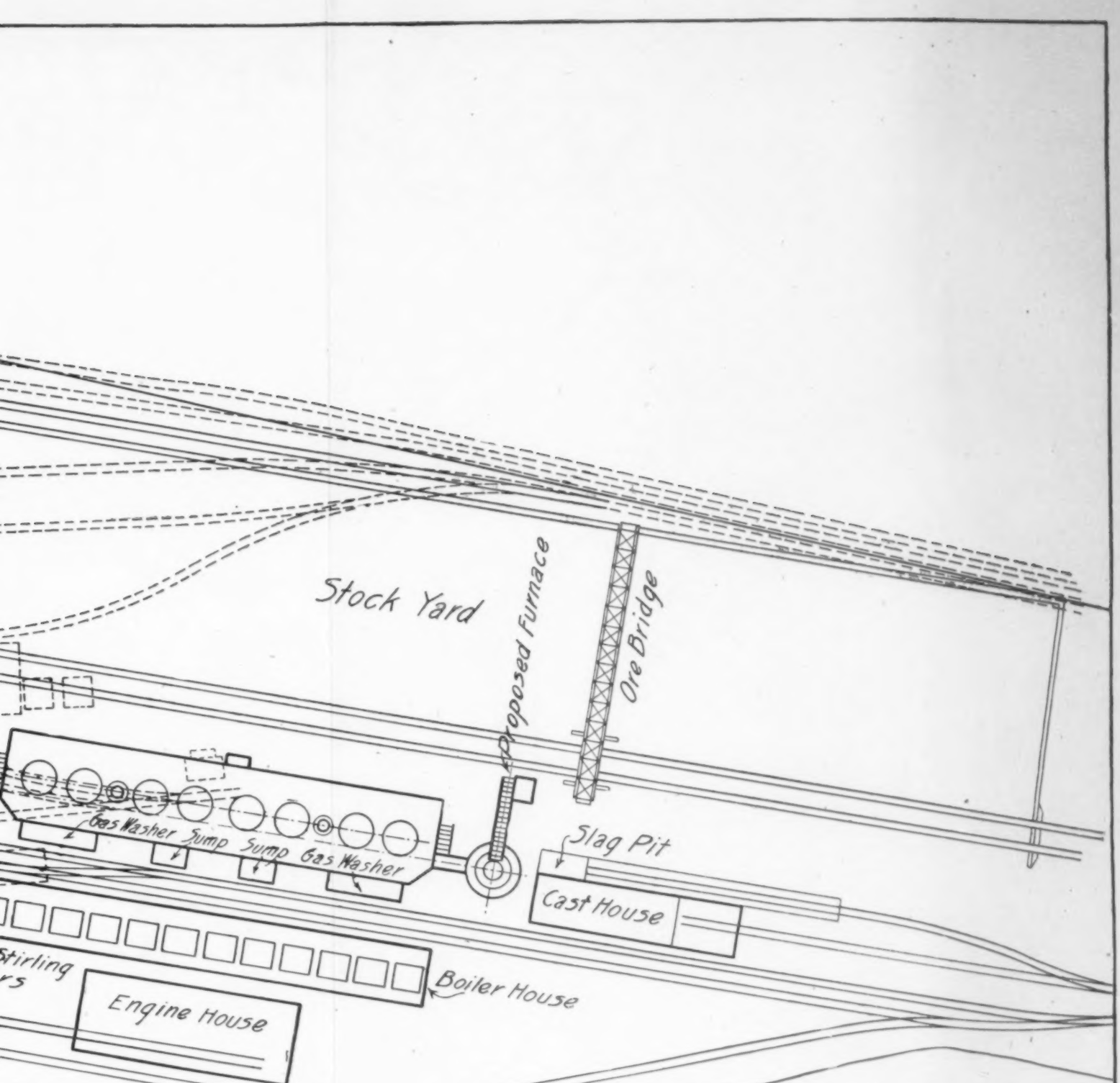
Intake

Power House

Oil House

Bank Line

Mahoning River



THE HASELTON FURNACE PLANT OF THE REPUBLIC IRON & STEEL CO.

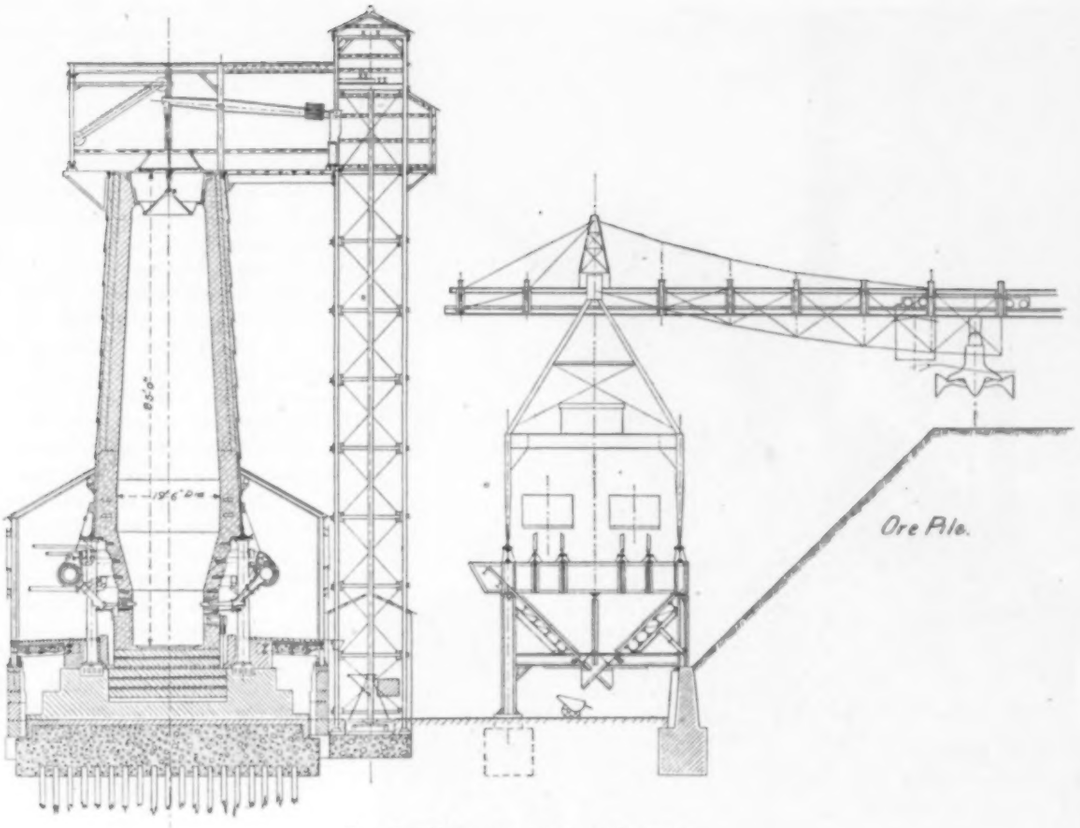


FIG. 3.—SECTION OF NO. 2 FURNACE.

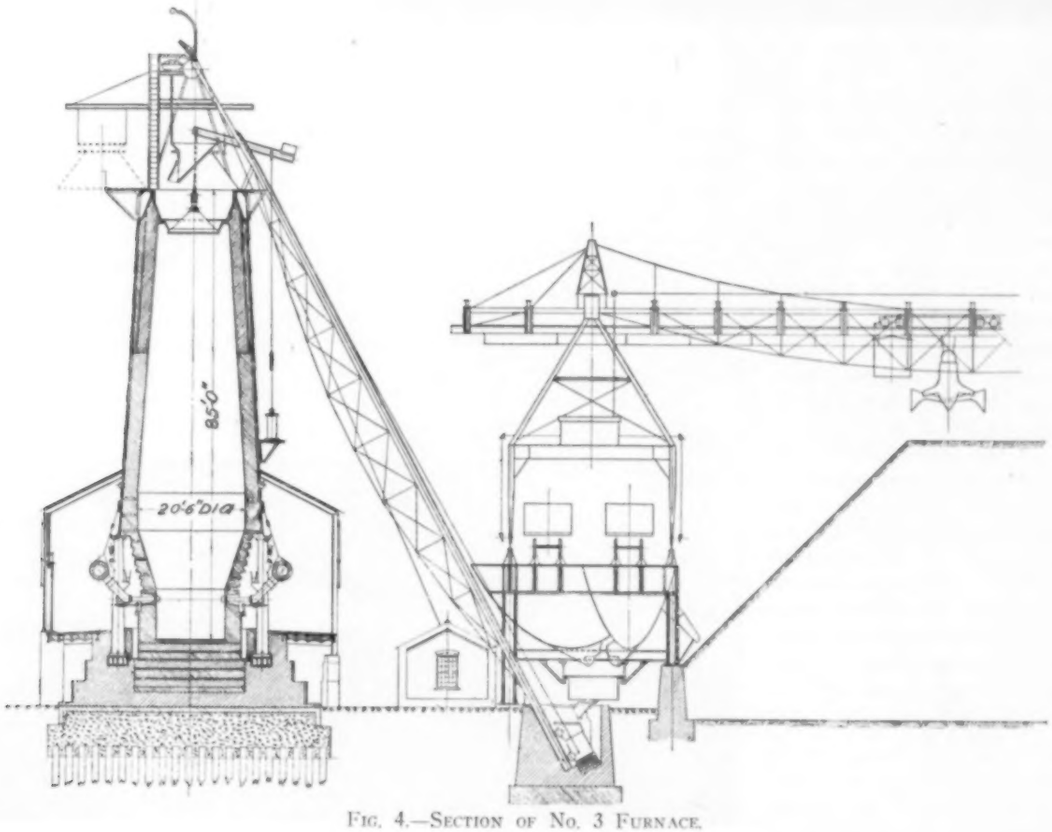


FIG. 4.—SECTION OF NO. 3 FURNACE.

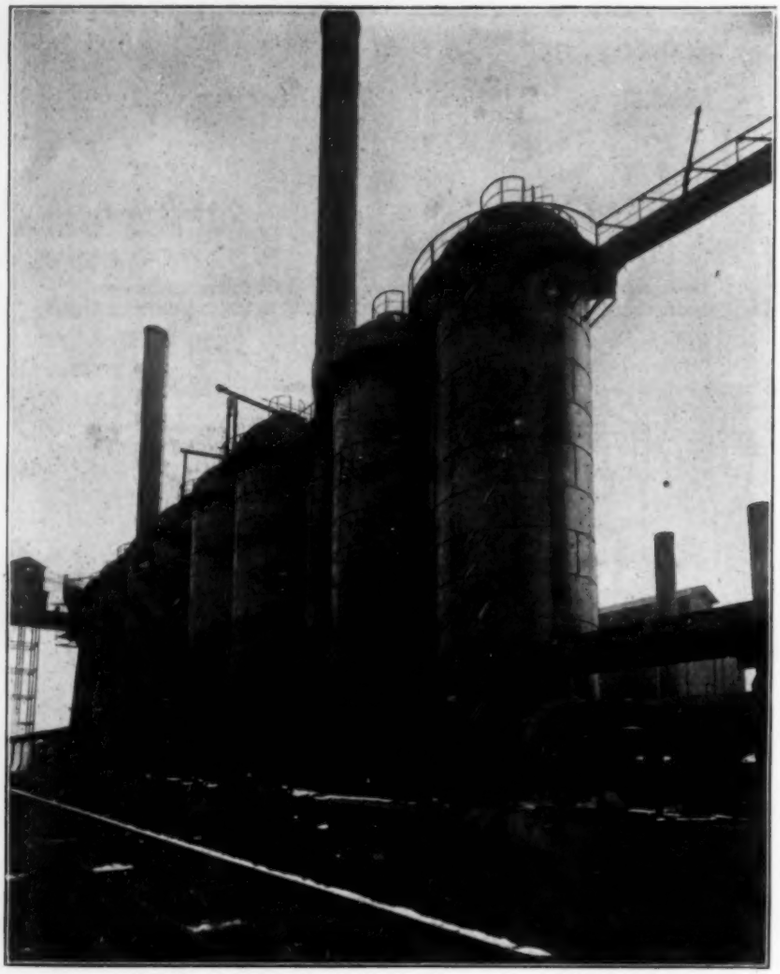


FIG. 5.—STOVES AT HASELTON FURNACES.

the foundation. The top inwall of each furnace is composed of 27-inch tile about three inches thick laid on the flat. The remainder of the lining is of the ordinary standard construction. The mud guns used in conection with the furnaces are mounted on a ball bearing crane and can easily be handled by one laborer.

In connection with the stoves, a number of minor improvements have been installed. Among them may be mentioned the design of the explosion doors used on the gas lines and furnaces. Crawford water seal valves are used in the gas line at the stoves and in the boiler house to take the gas from either furnace to either set of stoves or boilers. All feed and drain piping for supplying water to the stove valves has been placed below the level of the stove platform, giving a clear working space around the stoves.

Elimination of Vibration.

Vibration in the cold blast lines has been eliminated by tying the cross over lines from the engines to the stoves, and also by inserting a receiver in the lines close to the engine. This receiver comprises a tank into which the exhaust from the blowing engine is delivered, the exhaust pipe being bent down at right angles in the tank and extending almost to the bottom. The cross-over line to the stoves is taken out of the receiver from one side near the top. Vibration in the lines has, by this means, been entirely done away with. An application has been made for a patent to cover this device.

Disposal of Slag.

Slag from the furnaces is granulated except in emergencies when the cinder is taken in the molten condition by P. T. Berg standard hand-dump cinder cars of 200 cubic feet capacity. Seven of these are used, having been built for the furnaces by the William B. Pollock Co. The granulating pits are of concrete, located alongside of the cast houses as shown in the general plan. The granulated slag is removed from each pit by a two-cubic yard grab bucket suspended from a motor-driven trolley extending alongside the length of the cast houses. A 40-horsepower motor is used for manipulating the bucket and a 30-horsepower motor for traversing. The operator rides on the trolley. This mechanism was built and installed by the Browning Engineering Co., Cleveland. The runway for this trolley extends over railroad tracks upon which are the cars to be loaded with the granulated slag. Each of the cast houses is equipped with a 25-ton electric traveling crane for handling materials and repair work, and also for taking care of heavy masses of iron, which may result from a boil or other causes.

Stock House and Yard.

The stock house and yard is equipped with a double-track steel bin system extending the entire length of the yard, the ore being loaded directly into bins, or dropped through the trestle to the ore yard. It is moved back by a Brown Hoist ore bridge operating a seven-ton ore bucket. Ore taken from the yard is picked up by the same bridge and delivered into the ore bins direct, or into transfer cars placed on the trestle. The capacity of the ore yard is 350,000 tons. The bins are suspended between two concrete walls on the furnace side of the ore yard, which serve to support the double-track trestle and also the runway for the inner end of the ore bridge. A single concrete wall forms the outer boundary of the ore yard and forms the runway of the outer leg of the bridge. The outer supporting member of the bridge is a two-legged A-frame,

FIG. 6.—ORE BRIDGE AT HASELTON FURNACES.

while the inner one has four legs running on the two walls as described. The bridge is electrically driven, current being delivered to it from trolley wires placed at an elevation of about six feet above the surface of the trestle, thus obviating any danger to the men engaged in unloading cars or other work on the trestle. Ore bins are built only at the two ends of the trestle, the central portion being open and forming a portion of the ore yard. Coke and limestone bins are also installed at the ends of the trestle convenient to the furnaces. The ore bins are so arranged that after they are filled direct from cars the surplus ore falls into the ore yard without any moving of the cars.

As mentioned above, the filling of No. 3 furnace is accomplished with the aid of a suspended larry charging car. This larry charging car travels back and forth under the bins and delivers limestone, coke and ore to the bucket of the skip hoist, which runs underneath the ore bin. The larry car is electrically driven, current being supplied to it by a pair of trolleys. The larry car is provided with a scale by means of which the furnace charges are weighed before being delivered to the skip hoist. An additonal car is installed, but is kept on hand merely as a spare unit in case the one in service breaks down.

The metal is taken direct from the three furnaces over a 2½-mile private track to a 250-ton metal mixer at the Bessemer steel works of the Republic Iron & Steel Co. located in the heart of the city, the hot metal track being tunneled under two main line railroads. To convey the metal, three standard gage American locomotives of special design, and 17 standard P. T. Berg hot metal cars of 25 tons capacity manufactured by the William B. Pollock Co. are employed. On Sundays or other times when the Bessemer steel works are not in operation, the 1,200 tons of iron produced daily by the three furnaces are cast in a two-strand Uehling pig machine, which is located in a separate building some distance west of the furnace.

The blowing engine plant consists of five Allis-Chalmers blowing engines —three-high pressure long crosshead vertical engines, each 52 inches and 96 inches by 60 inches, the two low pressure long crosshead vertical engines, each 96 inches and 96 inches by 60 inches. The low pressure engines are arranged to be run compound with the high pressure engines or operated as single engines at reduced steam pressure. Of these, one high pressure engine is a spare. Two Worthington vacuum pumps are employed, in connection with two Worthington 30-inch jet condensers. The engine house is spanned by a 25-ton Niles crane. A railroad track runs into the engine house in a shallow pit, which is usually covered by floor plates. These can be removed wherever it is desired to bring a car in.

The boiler house is equipped with twelve 500-horsepower Stirling boilers. The gas mains from Nos. 2 and 3 furnaces connect through Crawford water valves; gas from either furnace can be used at any or all of the boilers or stoves. Water for the boilers passes through two Cochrane feed water heaters each of 3,000-horsepower capacity.

The pumping plant, which is designed to provide for the requirements of the three present furnaces, consists of six Platt duplex pumps, of 3,000,000 gallons capacity each and two Epping-Carpenter duplex pumps of 5,000,000 gallons capacity each.

Storage of water for the general service system is provided in a standpipe 20 feet diameter and 127 feet 6 inches high.

The electrical equipment includes two 150-kilowatt Crocker-Wheeler generators, each driven by a tandem-compound Buckeye engine at 220 revolutions per minute and one 300-kilowatt generator of the same type driven by

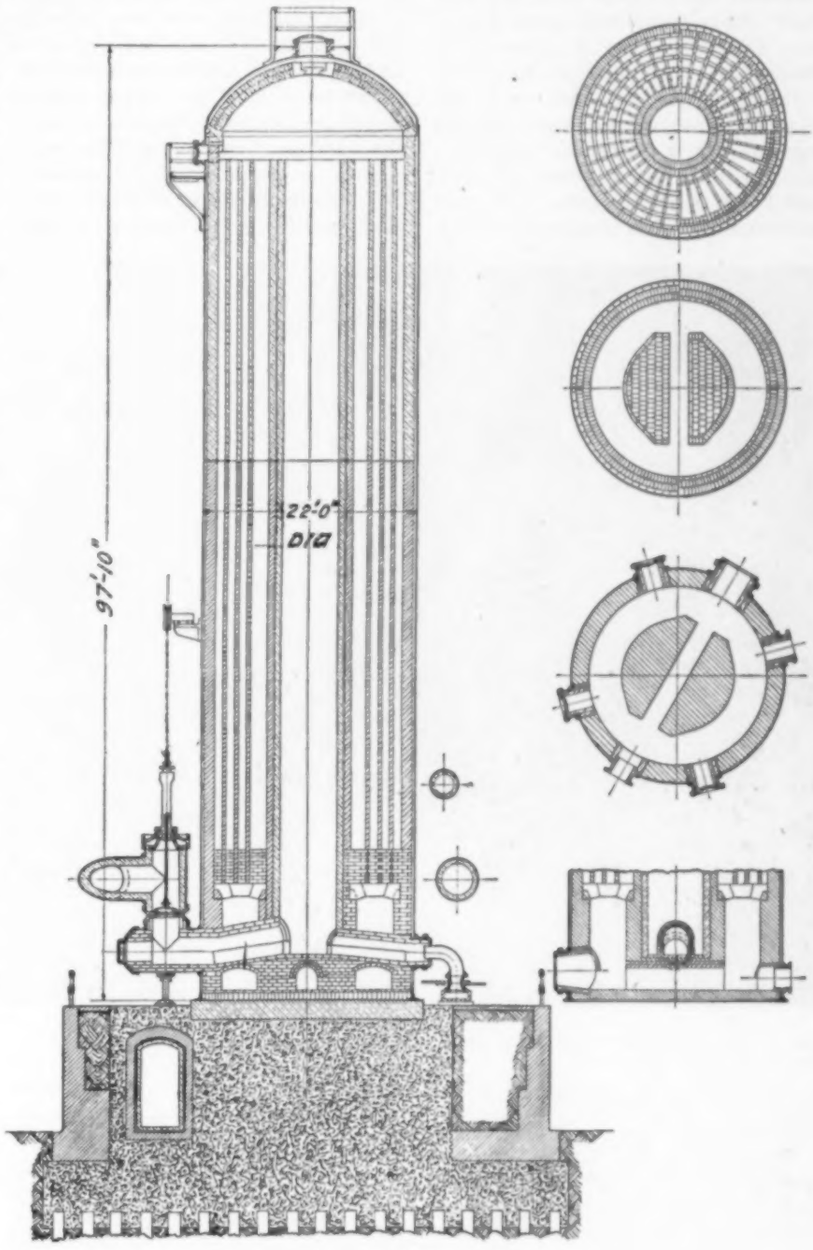


FIG. 7.—PLAN AND SECTIONS OF STOVES.

a Cooper Corliss engine at 100 revolutions per minute.

In addition to the private switching system, of adequate size to serve the entire plant and yards, the furnaces are connected with the following railroads: Lake Shore & Michigan Southern; Erie, Pittsburg & Lake Erie; Pennsylvania and Baltimore & Ohio.

The designing and erection of this plant was done by the local engineering force at Youngstown, under the supervision of J. W. Deetrick, manager; and apart from the steel work and accessories, such as engines, boilers, pumps, etc., no contract labor was employed.

The steel for the furnaces, stoves, stacks, gas washers, mains, etc., was made and erected by the William B. Pollock Co., Youngstown; the structural work for buildings, trestles, etc., by the McClintic-Marshall Construction Co., Pittsburg. All excavating, concrete work, brick work, sewers, tracks, erection of miscellaneous machinery, etc., was done by the company.

Probably the most interesting feature of this plant is the fact that side by side stand a hand-filled furnace of the most modern design and equipment, and a mechanically-filled furnace also modern in every respect, and all who are connected with furnace operations will be interested to know which of the two proves the more satisfactory from an operator's standpoint.

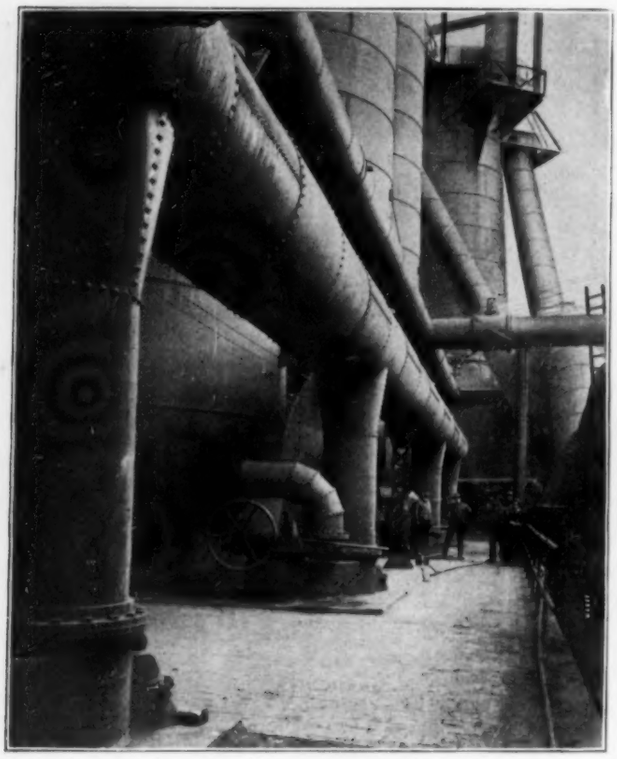


FIG. 8.—WORKING PLATFORM, BASE OF STOVES AND NO. 2 STACK.

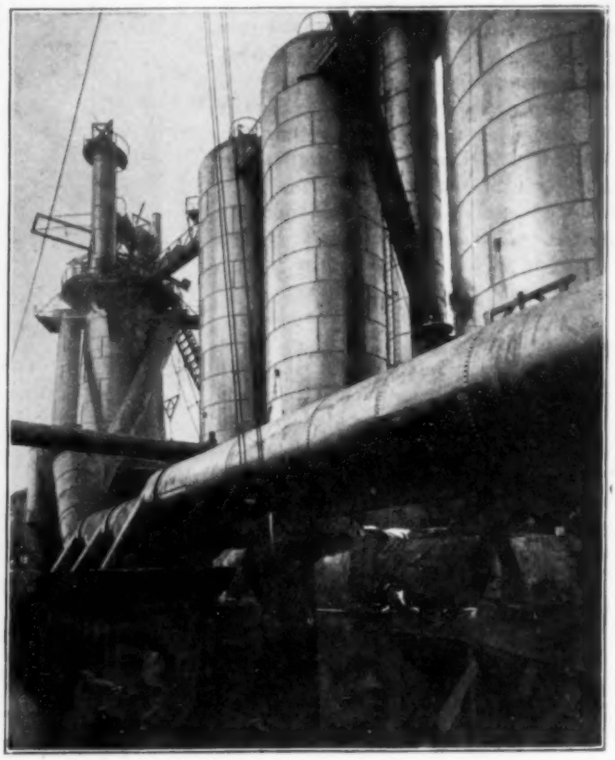


FIG. 9.—NO. 3 FURNACE, STOVES AND GAS WASHER.

Made Improvements.—Improvements executed or planned by the American & British Mfg. Co., a subsidiary of the International Power Co., cut its profit and loss balance to $8,527, compared with $140,878 in 1905, according to the annual report for 1906. Heavy gains in gross earnings were shown. Increased expenses also were paid and the year's surplus showed a marked improvement. The company's gross earnings amounted to $1,725,478, compared with $953,777 for 1905. Expenses increased from $782,494 in 1905 to $1,384,407 in 1906, leaving net earnings of $341,071, compared with $171,283. Charges amounted to $29,207, compared with $30,405 for 1905, leaving a surplus for the year of $311,864, compared with $140,878 the previous year. Improvement expenses were $153,337 and in addition $150,000 were set aside to create an extraordinary improvement fund.

Large Zinc Smelter.—The Metallurgical Co., of America, has completed a deal for a site in Collinsville, Ill., and will erect thereon a zinc smelter to cost $750,000. A right of way has been secured from the Vandalia railroad to the site, and a switch will be put in. It is estimated that the plant will be built and in operation in a year.

PRODUCTION OF METAL-WORKING MACHINERY.

The Department of Commerce and Labor has issued a bulletin detailing the production of metal working machinery in the United States during the period 1900-1905. The figures given in the census of 1905 cover the calendar year, 1904. The total value of all metal working machinery produced as shown by the census of 1905 was $32,408,766 compared with $24,737,904 given by the census of 1900, an increase of 31 per cent. The greatest production in metal working machinery was in Ohio. At the census of 1905 it produced 25 per cent of all the metal working machinery in the country. The exports of machinery in 1904 aggregated $3,716,709. The imports amounted to $3,184,968. The more important varieties of machinery produced and their value, as shown at the census of 1905 and 1900, are given in the following table:

	1905.	1900.
Power hammers	$ 832,698	$ 671,287
Forging machines	437,097	424,774
Stamping, flanging and forming machines	2,003,861	1,180,960
Punching and shearing machines	1,425,510	1,219,605
Lathes of all kinds	5,924,860	7,207,069
Boring mills	913,695	1,123,314
Planers, slotters and shapers	2,397,476	2,945,305
Milling machines	2,476,626	2,171,966
Grinding machines	1,310,903	880,965
Bolt, nut and pipe threading and tapping machines	899,197	698,362
Pneumatic hand machines	1,732,107	143,325

ENGLISH ELATED

By American Inquiry for Cotton Ties. —Decided Improvement in Business.

Office of THE IRON TRADE REVIEW.
Birmingham, Eng., April 6.

The finished iron trade is showing a marked improvement after the comparative quietude of the last month. Practically all the merchants are now buying once more. This applies to all sorts of finished iron, and especially to every kind of iron and steel scrap for which there is a great demand. The colonies are buying extensively, every post bringing fairly substantial orders. Canada is a customer for most descriptions, and Australia is buying much more heavily, especially in the way of galvanized sheets. The Dominion mostly takes sheets in their flat condition, the corrugation being done by the Dominion buyers to escape the duty. Some very good orders have been coming from Canada for galvanized buckets. This district has a great hold upon the galvanized trade, mainly because the iron has that peculiar kind of excellence which enables it to take the spelter coating without injuring the material.

There is some elation over a number of inquiries from America for cotton ties, for which several local makers have been invited to quote. It is many years since any were produced in this district, and it seems rather likely that any orders that may be forthcoming will find their way to Warrington, which important center escapes the serious railway charges which have to be paid by Midland makers. Some very good orders have been placed for chains in the Cradley district, mainly for ship building requirements, but the chains are likely to be a little dearer, because of a recent advance which has just been obtained in wages. This concession has caused general satisfaction, the chain making district having been very subject to sweating conditions, involving a good deal of unnatural toil and degradation to the unfortunate women workers who toil at the anvil and hearth almost all the hours when they are out of bed.

Competition in Tubes.

A significant indication of the course of prices is given by contracts which the Birmingham gas committee has just entered into. During the next twelve months the brass and copper fittings will cost the committee quite 20 per cent more, and there will be a very substantial advance in the gas coal contracts. Yet it is remarkable that for wrought iron tubes and fittings, the increase is only about 1 per cent. This speaks eloquently of the competition in the iron tube trade which has practically defied the counteracting influence of various attempts that the cost of production has very materially increased owing to substantial advances in the price of gas-strip. Either tube profits have been very substantial in the past, which seems unlikely, or the present margin must be extremely narrow.

Good Financial Reports.

Several of our largest firms report favorable results of the year's working.

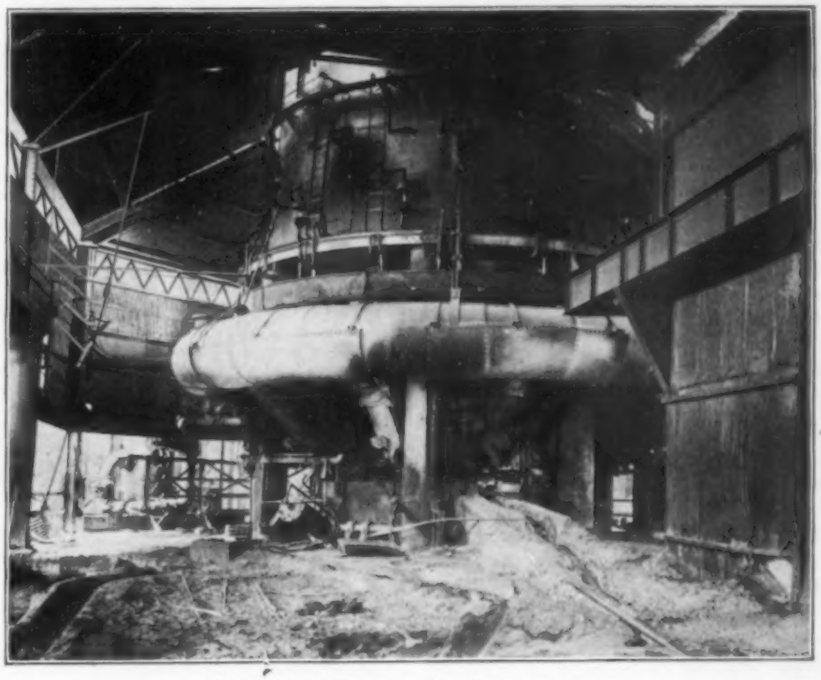


FIG. 10.—BASE OF NO. 2 FURNACE.

William Beardmore & Co., steel manufacturers, and armor plate, gun, and ordnance makers, again pay a dividend of six per cent on the ordinary shares, though the surplus is £96,500 as against £104,900 last year. The present dividend is the same as for some years past. The Barrow Hematite Steel Co. has a gross profit of £96,297 and a net amount of £49,181. The Duke of Devonshire pointed out at the annual meeting that the price of coke had greatly increased the cost of manufacture, and the directors had decided to install gas engines to supply a blast for four furnaces which it was hoped would effect a great saving. The Duke of Devonshire was re-elected a director with Mr. Cavendish and Mr. Schneider. A curious incident at the meeting was an effort by Canon Abbey to force the directors to pay a high dividend, but the effort did not succeed, the chairman, the Duke of Devonshire, declining to put the amendment to the vote.

The Harvey United Steel Co. again pays a dividend of 15 per cent, as it has done for the last six years. But on this occasion places £10,000 less to reserve than it did a year ago. Cammell, Laird & Co. again pay 10 per cent with a profit of £273,780 in comparison with £231,807 for 1905. Debenture charges were increased during the year by the issue of £750,000 worth of new stock. The company has completed the acquisition of a site for works at Crumlin Burrows, near Neath, and has acquired 4,000 acres of deep coal measure at Llansamlet in the same district which will be of great use to the works.

Armstrong, Whitworth & Co. pay a final dividend for the year of 20 per cent. But as the amount was smaller in the first part of the year, it is not likely that the total for the year will exceed the 15 per cent, which has been paid for several years past.

C. & W. Walker, Ltd., of Donnington, report a profit of £5.017 and a divisible balance of £8,419 from which they propose to pay 5½ per cent on preference shares and 10 per cent on ordinary shares carrying forward £5,319.

Stewarts & Lloyds, the great tube-making firm, report a net profit of £147,-525 and a divisible balance of £204,571. They propose dividends making the total for the year 10 per cent on ordinary shares. The firm has appointed George Arthur Mitchell managing director of the steel works department in the place

of R. M. Wilson, who has had to resign over ill health. Mr. Wilson will have a seat on the board of directors.

Wages' Adjustment.

The return of prices and wages under the North of England Wages Board was issued recently for January and February. The net average price for rails, plates, bars, and angles, was £6 19s 0.46d against £6 14s 11.26d in the previous return an improvement of over 4s per ton. This will give the men 2½ per cent advance, making 10 per cent since the trade improvement began. The total output was 11,449 tons against 11,344 tons for November and December. But the figures compare badly with the corresponding two months of last year, when the total was 13,274 tons.

BLAST FURNACE NOTES.

The furnace of the Globe Iron Co., Jackson, O., was blown out about the middle of March, and will probably be in blast again about May 10.

The Goodrich furnace of the Standard Iron Co. marked the third anniversary of its operation by breaking its record for production, making 1,801 tons in March.

The furnace of the Ohio Iron & Steel Co., Lowellville, O., has been shut down for repairs.

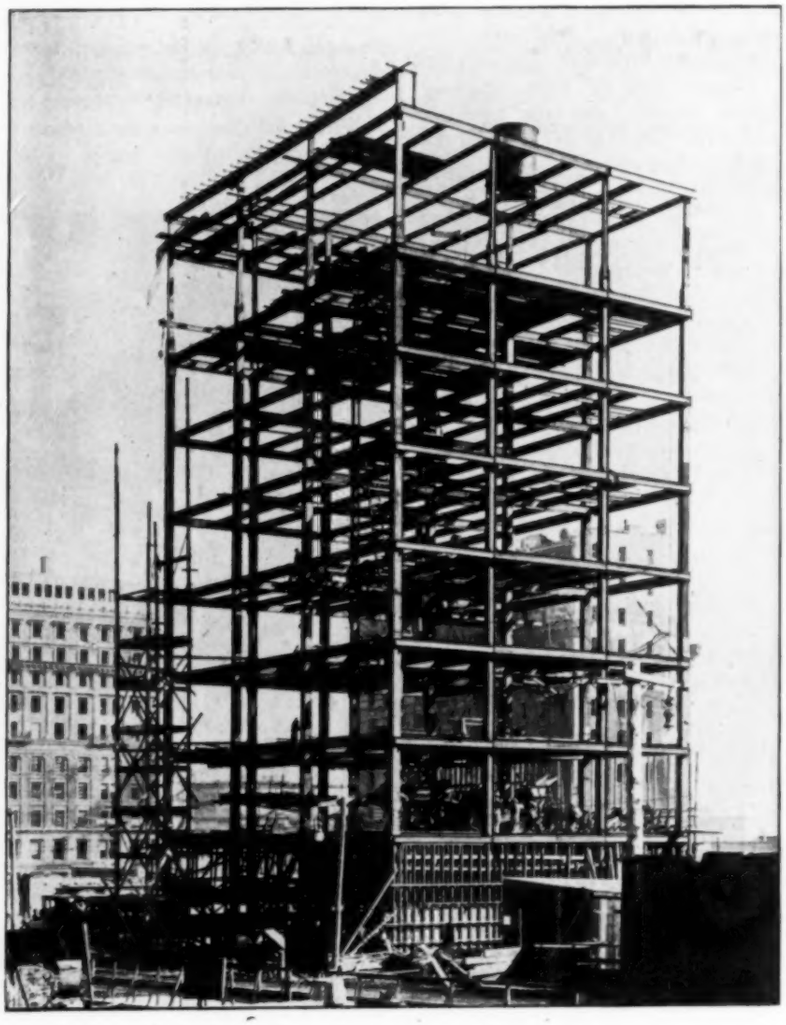
Establishes Scholarship.—The board of directors of the Pennsylvania railroad has accepted the offer of Anne Thomson, Frank Graham Thomson and Clarke Thomson to give $120,000 for the establishment of what is to be known as the Frank Thomson scholarship. It is the desire of the persons who establish the trust to afford to "sons of living or deceased employes of all the lines of the railroad an opportunity for a technical education, so as better to enable them to qualify themselves for employment by the company." Competitive examinations are to be held for the scholarships. To pass this examination every successful candidate must qualify for admission to one of the technical schools or colleges approved by the company. Beginning this year two scholarships, each of $600, are to be filled. Two are to be added each year and ultimately eight men are expected to be kept in college by the gift.

The Philadelphia & Reading Railroad Co. is planning to erect new shops and create a yard at St. Clair, Schuylkill county, Pa. The cost will be over $900,000.

Plans have been completed for the new shops to be built by the Seaboard Air Line, and bids are now being received for the construction of the building.

THE FIRST STEEL FRAME BUILDING IN NEW SAN FRANCISCO.

The Perry Eyre Building, at the southwest corner of Kearny and Sutter Streets, San Francisco, is the first steel frame structure to rise from the ruins of that stricken city. The accompanying illustration shows its appearance early in March, when the framework was practically completed.



THE PERRY EYRE BUILDING, SAN FRANCISCO.

To win the distinction of being the first of its kind erected after the fire, varied and unusual difficulties had to be overcome, the least of these being the securing of the steel, of which some 500 tons were required. Contracts for furnishing the structural steel were signed with the American Bridge Co., Sept. 20, 1906, about five months after the conflagration. Drawings were made, and the materials fabricated and shipped by Nov. 15 following, although the contracts called for the completion of shipments by Dec. 1, or two weeks later. The fabricating was done at the Pencoyd works.

After the arrival of the steel in San Francisco a delay of practically two weeks was occasioned by the inability of the contractors to secure the heavy cast iron bases for the building, although orders had been placed with a local foundry a considerable time before the steel was arranged for. The Thompson-Starrett Co. is erecting the building. In the background of the illustration are shown several office structures of the steel frame type which went through the fire and are being put in shape for occupancy.

The trade paper attracts the real buyers as a magnet attracts iron. But not any old piece of iron, bent horseshoe shape and painted red, is a magnet. It must be alive. It must draw. And the matter must be served up attractively, headed, sub-headed, illustrated and labeled, not with reference to its technicalities, but with reference to the wants of readers.—*The Selling Magazine.*

THE ART OF CUTTING METALS[1]

(Continued from last week.)

By Fred W. Taylor.

THEORY OF HARDENING STEEL.

Investigations Made to Find an Explanation or Theory for the Phenomena Connected with "Chromium-Tungsten" High Heated Tools.

The facts regarding the effects of heat treatment on "chromium tungsten" and "chromium molybdenum" tools have been carefully investigated, and recorded as above. As yet, however, no theory has been advanced which in the judgment of the writer explains these phenomena. Investigations were made on this subject by Otto Bohler, of Austria, in 1903, and published in an article by him entitled "Wolfram und Rapid Stahl." Several articles have been written also by Messrs. Osmond and H. LeChatelier, both of whom are among the most careful and scientific investigators in the metallurgical field, and valuable data are given by Mr. J. E. Stead, in his contribution to the discussion in the Report of the Alloys Research Committee of the Institution of Mechanical Engineers; but the most thorough and up-to-date investigation which has come to the writer's attention is that made by Prof. H. C. H. Carpenter, Ph. D. of the National Physical Laboratory in England, and published in the "Journal of the Iron and Steel Institute," 1905, p. 433. In their papers on this subject all of these writers, however, assume that the reader already has a certain familiarity with the subject, and they use without definition, words and certain technical expressions and even conventional symbols which render their writings more concise and more simple but only to one who has read much that has previously been written. These special technical expressions make it difficult for even an educated engineer to clearly understand their articles without very considerable study. The present paper is intended not only for engineers familiar with the subject, but more especially for shop superintendents, managers and foremen, many of whom have but small familiarity with the scientific or metallurgical side of the problems. The writer will, therefore, endeavor to give in simple words an explanation of some of the more important phenomena developed by these gentlemen.

Carbon or tempered tools are made from tool steel containing from 0.75 per cent up to about 1.5 per cent of carbon. In addition, this class of tool steel contains small quantities of silicon, manganese and, unfortunately, phosphorus and sulphur. The hardness of tools made from this class of steel, however, depends mainly upon the carbon, and carbon exists in tools, broadly speaking, in two conditions or states; one of which may be called the hardening carbon and the other the softening carbon, the technical names given to these two conditions being cementite and pearlite. A bar of this carbon tool steel as it is received from the maker contains carbon practically all in the softening state. After the tool is forged to shape, in order to harden it, as is well known, it must be heated above a certain definite temperature. This temperature varies according to the amount of carbon, manganese and silicon which are present in the tool steel; but, in general, it is fairly close to 1,450 degrees Fahr. (786 degrees Cent.). When these tools are heated slightly beyond 1,450 degrees Fahr. (786 degrees Cent.) the softening carbon is changed entirely into hardening carbon, and it takes a certain interval of time for this change in the form of the carbon to take place. If the tool is then cooled slowly until it is below 1,400 degrees Fahr. (760 degrees Cent.) the form of the carbon is again changed back from hardening to softening carbon. This change backwards and forwards from hardening to softening carbon, or vice versa, will take place each time the tool is heated above 1,450 degrees Fahr. or cooled below 1,400 degrees Fahr.

It is doubtless due to the fact that the transformation from the hardening form to the softening form of carbon requires a certain appreciable length of time that carbon steel tools can be hardened at all. If tools are heated above 1,450 degrees Fahr. and are plunged into cold water, or very rapidly and continuously cooled in any other way, until they arrive at a temperature below about 392 degrees Fahr., at no period in the process of cooling is time enough allowed for the hardening carbon to change its form into softening carbon, and after the temperature of the two is below 392 degrees Fahr., the hardening carbon is imprisoned, as it were, in its hard or diamond-like form in the tool, and gives to the whole tool its hardness; and as long as a tool remains below 392 degrees Fahr., the change from hardening back to softening carbon cannot take place. If the process of cooling a carbon steel is halted, however, at any point between the temperature of 1,400 degrees Fahr. and that of 392 degrees Fahr., even for a comparatively short time, then to a greater or less degree, the change from hardening to softening carbon will take place.

Tools which have been hardened by sudden quenching from 1,450 degrees Fahr. are in most cases too brittle for practical shop use, and they are softened or "tempered" to any desired degree by reheating them above the temperature of 392 degrees Fahr. The higher the tool is heated above this point up to about 600 degrees Fahr., the softer it becomes as the hardening carbon is gradually changed back into softening until at 600 degrees Fahr. it is entirely soft.

M. LeChatelier invented an exceedingly sensitive and accurate pyrometer for rapidly measuring the heat at higher temperatures, and investigations made a number of years ago with this pyrometer demonstrated the fact that as the carbon is changed from its hardening to its softening form, so definite and powerful a molecular action or change in the internal structure takes place inside the steel as to actually develop a very considerable amount of heat. Therefore, as a tool which has been heated enough to contain carbon in the hardening form is gradually cooled when it reaches the critical temperature 1,400 degrees Fahr., at which this internal molecular change occurs, the heat brought about by this molecular disturbance is actually sufficient in many cases not only to entirely stop for a considerable length of time the cooling of the tool, but to slightly reheat the tool; and it is for this reason that this point of carbon transformation from hardening to softening and vice versa has come to be called the "reheating point," the "point of recalescence" or the "critical point" in the tool steel. The heat which is developed by this molecular change, however, is not always sufficiently great to actually reheat the steel to a higher temperature, although in all cases it checks and temporarily slows down the rate of cooling. For this reason this change point in the carbon is more frequently called the "critical point" and this would appear to be on the whole, a better name.

All tool steels, whether of simple car-

[1]Presidential Address, A. S. M. E., 1906.

bon or of the later high-speed varieties, have at least one critical point, and many of them two or more critical points, in cooling down from a high heat to the normal temperature of the air, and it must be remembered that in each case these critical points shown by the cooling experiments indicate that some internal molecular change has taken place. In heating carbon tool steel the lower critical point is, generally speaking, between 392 and 600 degrees Fahr., at which point softening or tempering is taking place. And the upper critical point, as before explained, occurs at about 1,450 degrees Fahr., at which point softening carbon is changed back into hardening carbon. The critical points in heating tool steel, however, do not occur at the same temperature as those for cooling, showing that the internal chemical or molecular changes in the carbon or other ingredients do not occur at the same temperature while the heat is going upward as they do while the heat is going downward. (See Figs. 119 and 120.)

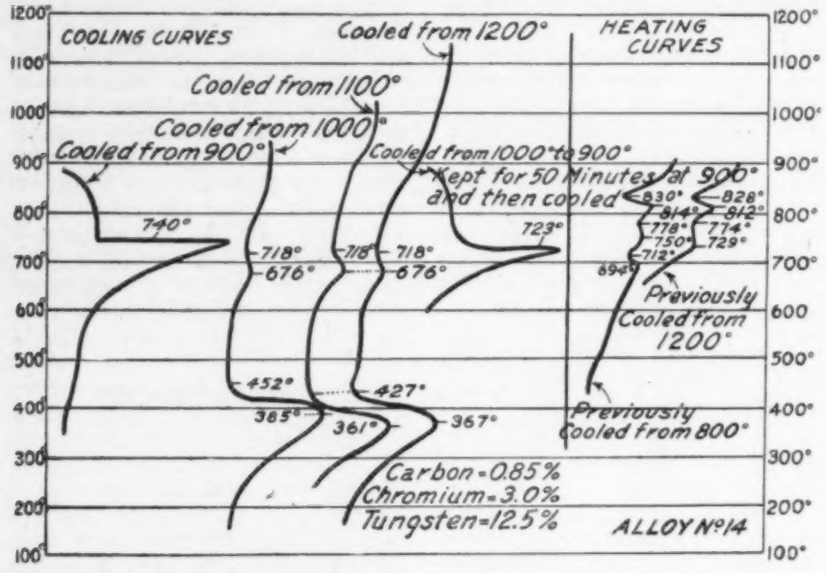


FIG. 119.—HEATING AND COOLING CURVES OF TWO MODERN HIGH SPEED TOOL STEELS.
The effect of heating these steels beyond 725 degrees Fahr. (the point indicated by the experiments at which the remarkable properties of high speed tools begin to be produced) is shown by the change at the critical point of the cooling curves. Experiments made by Prof. H. C. H. Carpenter, Manchester, England.

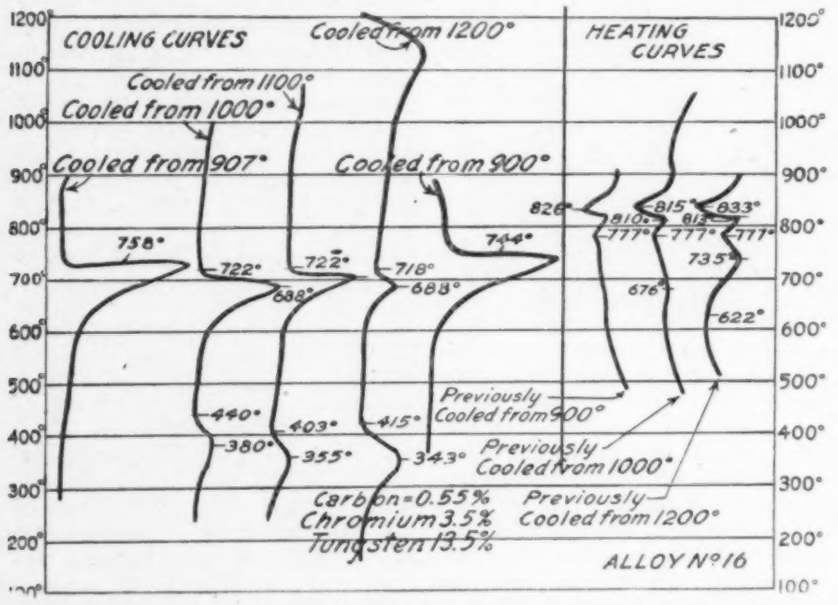


FIG. 120.—HEATING AND COOLING CURVES OF TWO MODERN HIGH SPEED TOOL STEELS.
The effect of heating these steels beyond 725 degrees Fahr. (the point indicated by the experiments at which the remarkable properties of high speed tools begin to be produced) is shown by the change at the critical point of the cooling curves. Experiments made by Prof. H. C. H. Carpenter, Manchester, England.

By comparing the critical points, Figs. 119 and 120, in the heating curves shown at the right hand side of the vertical line with the critical points of the cooling curves on the left hand side, it will be noted that the principal critical point in heating is higher by about 160 degrees Fahr. than the principal critical point in cooling. The operator who is hardening carbon steel, therefore, is much more interested in the heating than in the cooling curve, as it is to the former that he looks to find the critical point just above which he must heat his tool in order that it may harden thoroughly, preserve a fine grain, and be free from the brittleness and various troubles which come from overheating.

All of the theorists who write upon this subject practically agree that the hardness of old-fashioned, self-hardening tools is due primarily or principally to the presence of carbon in the steels (that if carbon were removed from self-hardening steels they would not be much if any harder than carbon tool steel would be if the carbon were removed from it); namely, that without carbon all qualities of steel would be soft so far as metal cutting properties are concerned.

We have just pointed out that carbon (in ordinary tool steel) which exists in the "hardening" condition when the steel is heated above the critical point changes in an exceedingly short time to carbon in the "softening" condition after the tool is cooled below the critical point. A few seconds or minutes, depending upon the size of piece, are sufficient time for the change from hardening to softening carbon to take place in ordinary carbon steel tools.

The theory explaining why the old-fashioned, self-hardening tools have their property of hardness is that when these tools are heated up to above the critical point and the carbon is formed into the "hardening" state, and they are then cooled below the critical point, the hardening carbon instead of changing quickly to softening carbon (as in ordinary tool steel) becomes tangled, as it were, with the tungsten and manganese, and takes many hours to change from the "hardening" to the "softening" state, instead of a few seconds or minutes, as with ordinary tool steel when tungsten and manganese are not present to any large extent.

A tool, however, after being forged, even if laid down in the air to cool, will cool down to a black heat in a few minutes at most; so that with self-hardening tools in practical, everyday conditions, there is never sufficient time, owing to the tangling or retarding effect of tungsten and manganese, for the carbon to change from the hardening to the softening condition.

We believe that this theory is substantially correct as far as the quality of

"hardness" is concerned, but as we shall point out later, it does not at all account for or explain the new property of "red hardness" which is the characteristic of high speed tools. And so far as we know, theoretical writers on the subject have up to this time confused these two properties, speaking of the new property of "red hardness" as though it were the same as "hardness."

Most modern scientific articles which have been written on the hardening and the tempering or softening of steel tools treat mainly of two subjects:

a the crystalline or other structure of the steel, as affected by heat treatment and chemical composition, and as revealed by polishing, etching with acid and examining with a microscope; and

b a study of the critical temperatures just referred to, and of the very evident connection of these critical points with the powerful internal changes in the quality, condition or formation of the carbon which causes the tool to be hard in one case and soft in another.

A clear understanding of the effect of these critical points upon hardening is helped by diagrams showing them graphically.

If paper be ruled with horizontal lines at equal distances apart which represent increases in temperature, say of 100 degrees each, and if upon paper ruled in this manner a line be drawn consisting of a series of dots which are spaced at distances one from another, corresponding to the rapidity with which the temperature of the steel falls as it is cooled; when the critical points in the cooling are reached, the cooling curve will be bent sharply either to the right or to the left, forming a very definite and clearly visible break or sharp deflection from the general line of the curve, and in this way the exact location of the remarkable changes in the carbon of the steel from hardening to softening carbon, etc., becomes visible at a glance.

In the diagram, Fig. 121, is shown one of these curves which represent the critical points in cooling and heating steel of the chemical composition of ordinary carbon or tempering tool steel, and in the diagrams, Figs. 119 and 120, are shown cooling and heating diagrams of the modern high-speed tools. Fig. 121 was sent to the writer through the kindness of Prof. H. C. H. Carpenter, and Figs. 119 and 120 are reproduced from Professor Carpenter's paper above referred to. These diagrams represent the best work of this character which has as yet come to the attention of the writer.

In Fig. 119 (Alloy 14), and Fig. 120 (Alloy 16), is represented the cooling of two different modern high-speed tool steels of the following chemical compositions respectively:

FIG 119.

Carbon	0.85 per cent
Chromium	3.0 per cent
Tungsten	12.5 per cent

FIG. 120.

Carbon	0.55 per cent
Chromium	3.5 per cent
Tungsten	13.5 per cent

The curves on the left hand side of the vertical line represent the cooling curves, those on the right hand side represent the heating curves. The five curves on the left hand side represent the cooling of the steel after it has been heated to 1,652 degrees Fahr. (900 degrees Cent.), 1,832 degrees Fahr. (1,000 degrees Cent.), 2,012 degrees Fahr. (1,100 degrees Cent.) and 2,192 degrees Fahr. (1,200 degrees Cent.), respectively, and in all of these curves sharp bends to the right which begins to occur at from about 1,364 degrees Fahr. (740 degrees Cent.) to 1,324 degrees Fahr. (718 degrees Cent.), indicate very clearly the critical points at which some powerful molecular change occurred during the process of cooling.

Mr. White and the writer, during the original development of modern high-speed tools by us, accurately heated chromium-tungsten tools of standard shapes, one set after another, to different temperatures, and then determined their standard cutting speeds. This accurate practical heating and running of the tools (without any theory on our part as to the chemical or molecular causes which produced the extraordinary phenomena) led to the discovery that marked improvements in the cutting speed of chromium-tungsten steel were attained by heating the tools from a temperature of 1,725 degrees Fahr., up close to the melting point; the higher the point to which the tools were heated, the greater was the cutting speed attained.

By referring to the several curves, it will be noted that in the 1,652 degrees Fahr. (900 degrees Cent.) curve (on the extreme left of the diagram) which is below the point (1,725 degrees Fahr.) at

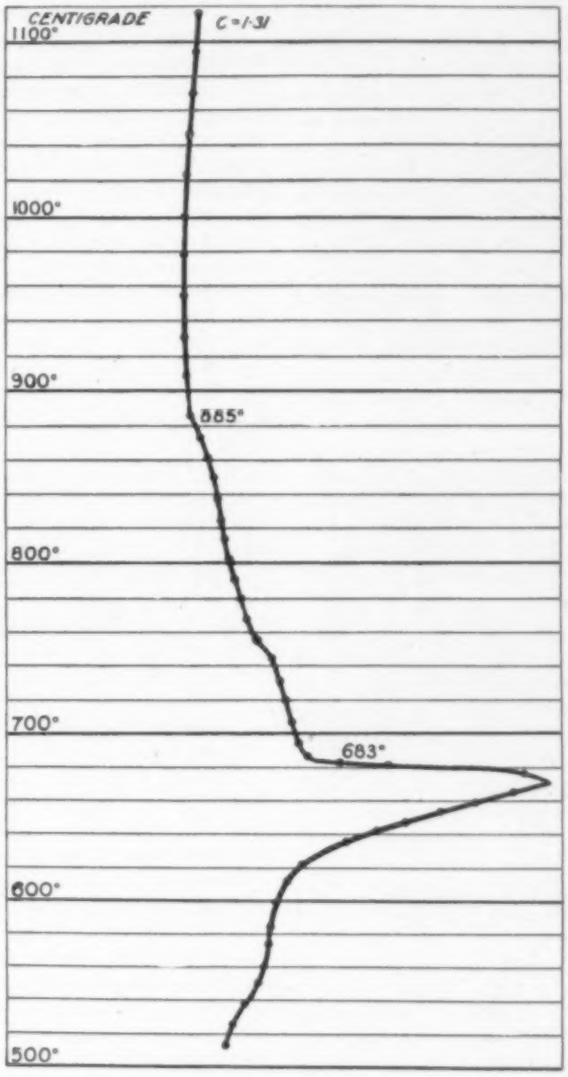


FIG. 121.—COOLING CURVE OF CARBON STEEL OF SAME COMPOSITION AS ORDINARY TOOL STEEL.

which high heating begins to make large improvements in the cutting speed, there is much greater deflection or internal chemical change when the critical point is reached in cooling the tool than in the curves of those tools which were heated to the higher temperatures, and that particularly in the diagram (Alloy 16), Fig. 120, the higher the tool is heated, the smaller becomes the sharp bending of the curve to the right, and therefore the smaller becomes the molecular action or change in the cooling down the tool at the 1,332 degrees Fahr. (722 degrees Cent.) critical point.

It would seem logical, therefore, to infer that there is some connection between the increase in the cutting speeds of these tools as they are heated higher and higher, and the diminution in the molecular action at the 1,364 degrees Fahr. (740 degrees Cent.) and 1,324 degrees Fahr. (718 degrees Cent.) critical points. Yet it must be remembered that "high-speed" tools possess the two distinct properties of "hardness" and "red hardness" and that the high heating (in the case of chromium-tungsten tools) progressively improves both of these qualities; therefore our experiments and observations have led us to the conclusion that these heating and cooling diagrams are valuable chiefly in their relation to the quality of "hardness," not in their relation to "red hardness." Our reasons for this will be given later.

Curves or diagrams of the type shown in Figs. 119 and 120, however, throw no light upon the important question as to the exact heat at which the tempering or softening of the high-speed tool begins, or as to what range of temperatures this softening process extends over. After writing his interesting paper, above referred to, Professor Carpenter made another investigation, the results of which were published under the title of "Tempering and Cutting of High-Speed Steels" in the "Journal of the Iron and Steel Institute," July, 1906, for the purpose of determining the range of the temperatures at which tempering or softening of high-speed tools begins, and the range of temperatures through which softening extends and is finally completed. In this investigation he used the first method (*a*) of scientific investigation above referred to; namely, the microscopic structure of the steel. In Figs. 122-126, we reproduce one of his plates illustrating the typical structure of high-speed steels proceeding from its hardest to its softest state, and we quote Professor Carpenter's discussion of these plates, making extracts from pages 4 and 5 of his paper:

"Characteristic structures of the hardened and fully tempered or softened alloys are shown in Figs. 122 and 126. Fig. 122 consists of white polyhedral crystals, and Fig. 126 of small white crystals embedded in a darkly etching matrix. The difference between the two types of structure is very characteristic, and the progress of tempering can be followed readily by microscopic examination. No tempering occurs below 550 degrees Cent. At this temperature the structure seen on Figs. 123 and 124 is obtained. The white areas represent untempered material, the colored areas parts where tempering has begun. Tempering starts from a series of centers, and gradually invades the rest of the material. Photomicrograph, Fig. 124, shows that the incipiently tempered material consists of a mixture of lightly colored polyhedra, needles and a darkly colored matrix. At 600 degrees Cent. the white polyhedra disappear, and the structure consists of a fairly uniformly colored, ill-defined granular mass from which all evidence of polyhedra is absent. The dark patches probably represent the centers from which tempering proceeded (see Fig. 125). At 650 degrees small white crystals make their appearance, but they do not attain their proper proportion, corresponding to fully tempered material, until after treatment at 700 degrees Cent. Thus in the case of this alloy tempering was structurally detected at 550 degrees under the conditions of experiment chosen, but was not complete till 700 degrees."

In reading the above quotation it should be borne in mind that Professor Carpenter used the word "tempering" in the sense of progressive softening, or what is commonly called by blacksmiths in the case of ordinary carbon tools "drawing the temper."

Professor Carpenter made elaborate tempering or softening experiments at accurate temperatures upon nine different alloys, some of which represented the best modern high-speed tools at that time available, while others represented steels more or less approximating to the best high-speed tools. In the course of this investigation it appeared that one of these alloys of the following chemical composition required to soften it materially higher temperatures than any of the others.

	Dr. Mathew's Steel No. 8.	No. 8b.
Carbon	0.47	0.430
Silicon	0.15	0.048
Sulphur	low	0.012
Phosphorus	low	0.022
Manganese	0.1 to 0.2	0.172
Chromium	2.99	3.103
Molybdenum	4.29	4.172

The etched specimens examined with the microscope showed that this alloy began to distinctly soften at a higher temperature than any of the others, and was not completely softened even at 930 degrees Cent., while the others were completely softened at about 700 degrees Cent. In view of this very high softening point for this particular steel, Professor Carpenter had cutting tools made from steel very closely resembling those of the analysis shown in column No. 8b, and these tools were run in competition with high-speed tools in general similar in composition to the following:

Carbon	0.55 per cent
Chromium	3.5 per cent
Tungsten	13.5 per cent

The result of these practical speed tests with tools showed that the steel which resisted tempering or softening at the high heat of 800 to 930 degrees Cent. was far inferior in cutting properties to the high-speed steel which was completely softened at about 700 degrees Cent.

This experiment, which was very thoroughly conducted, shows conclusively that this second scientific method of investigation fails in attempting to establish any practical relation between the cutting properties of high-speed tools and their microscopic structure and this conclusion agrees exactly with that arrived at by Mr. White and the writer in our original investigation in developing the high-speed tool. We found, as stated in our patent, that many high-speed tools contain austenite, a structure only to be produced by excessively high heats and indicative of great hardness. We also found in our microscopic examination other structures somewhat similar to those illustrated by Professor Carpenter. Although our examination in this direction was far from being as thorough as that of Professor Carpenter, we went far enough to completely satisfy ourselves that there was no traceable relation between the highest cutting speeds and any particular one of the microscopic structures. We examined several high-speed tools which showed equal cutting properties and yet whose microscopic structure differed very materially.

Professor Carpenter has traced the relation between these microscopic structures and the "hardness" of the tools, and we have no doubt that in this investigation,—as well as in his former investigation showing the relation between the cooling curves and the "hardness" of the steel,—that he is correct; but like all the other scientific writers on this subject whose works have come to our attention, he has failed to recognize the existence of "red hardness" as a property of these steels entirely independent of hardness. We would again call attention to the fact that the highest degree of "red hardness" can be found in these high-speed tools when accompanied either by the highest degree of hardness, on the one hand, or by a very considerable degree of softness, on the other hand. And we repeat most emphatically that hardness in high-speed tools is in no sense a guide to their high-speed qualities which depend mainly upon the quality of red hardness. As illustrating this fact, we refer again to the photograph,

Fig. 115, which shows a high-speed tool with deep nicks which were readily filed in it with an ordinary carbon steel file after it had run successfully at high speed. It is also a fact that the No. 1 tool, Table 116, which when properly treated represents the best all-round modern high-speed tool for cutting metals of all qualities experimented with is not a particularly hard tool. It is less hard, for example, than the old-fashioned Mushet tools, and far less hard than almost all of the high-speed tools alloyed with molybdenum. It can be filed with a hard carbon steel file, and yet, in spite of being only moderately hard, it possesses the very highest degree of red hardness.

We would also call attention to the fact that in Professor Carpenter's description of the photographs of the steel structures illustrated in Figs. 122-126 he states that softening has proceeded so far at the temperature of 1,022 degrees Fahr. as to change the hard structure shown in Fig. 122 to the distinctly softer structure shown in Fig. 124. It will be remembered that the very best high-speed tools were produced by reheating the tool to a temperature of 1,150 degrees Fahr. This was done for the purpose of imparting the very highest degree of red hardness to the tool. It is clear, then, that if softening has progressed, as shown in Professor Carpenter's paper, very materially at a temperature of 1,022 degrees Fahr. and if, on the other hand, the highest degree of red hardness is imparted to the tool by reheating it to at least 1,150 degrees Fahr., there is not only a great difference between the qualities of "hardness" and "red hardness," but also that these two qualities are not affected to the same temperatures. Before accepting a theory in any particular case, the facts should be thoroughly established and verified, and the theory if correct should thoroughly account for all of the known facts.

It is clear that as to high-speed cutting tools the most important facts are best established by carefully heating the tools to known temperatures and then running them in standard speed tests under uniform conditions in cutting uniform metals. This method of determining the qualities of cutting tools may be briefly called the method of "heating and running" the tools; and this, as already explained, was the method originally adopted by us in developing the high-speed tools for arriving at all of the important facts then developed. Of these facts the most important are:

a How to produce tools having the greatest red hardness, that is, tools which will run at the highest standard cutting speeds on different qualities of metal; and

b The determination of at what temperatures and in what manner the quality of red hardness in the high speed tools is impaired or broken down.

As we have already stated in our description of the experiments tried by us during the summer and fall of 1906, it is an extraordinary fact that the heat treatment originally developed by us through this method of "heating and running" the tool still continues to produce a greater amount of red hardness and higher cutting speeds than any heat treatment since devised. We have not, however, since the original development of high speed tools in 1898 investigated by the method of "heating and running" the second important fact, namely, at what temperature the quality of red hardness in the higher chromium and tungsten tools begins to be impaired. It may be that the best recently developed high speed tools will hold their quality of red hardness at higher heats than those determined by us, and it is of great importance that this subject should again be thoroughly investigated by the sure, though slow and expensive, method of heating and running.

Our original investigations showed that red hardness was impaired by heating tools above 1,200 degrees Fahr., and that the quality of red hardness was entirely removed by heating them up to 1,350 degrees Fahr. and holding at that temperature for any length of time. Now, it will be noted that in the heating curves shown by Professor Carpenter, no critical point is shown at these tem-

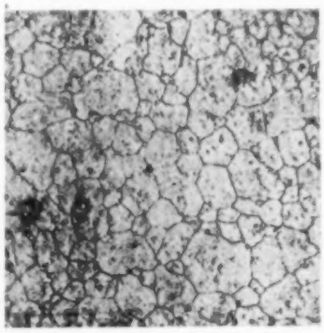


Fig. 122—After thorough hardening to 2192 degrees Fahr.

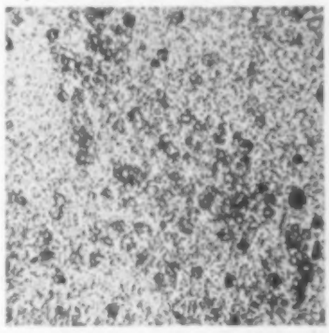


Fig. 125—After the tempering or softening has proceeded so far as to entirely change the original structure as shown in Fig. 122 heated 1112 degrees Fahr.

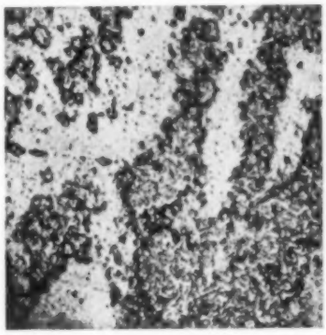


Fig. 123—After tempering or softening has begun by heating to 1022 degrees Fahr.

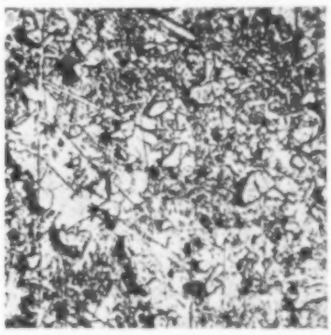


Fig. 124—After tempering or softening has begun by heating to 1022 degrees Fahr.

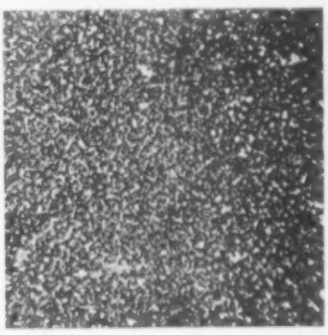


Fig. 126—After tempering or softening is completed, heated to 1292 degrees Fahr.

FIGS. 122-126.—CHARACTERISTIC STRUCTURES OF CHROMIUM-TUNGSTEN STEELS, HEATED TO 2,192 DEGREES FAHR., AND COOLED AS THEY WOULD BE TO MAKE GOOD HIGH SPEED STEEL.

Steels treated, specimens etched and photographs made by Prof. H. C. H. Carpenter, Manchester, England. These photographs illustrate the difference between "hardness" and "red hardness." They show that high speed tools begin to soften at 1022 degrees Fahr., while diminution in red hardness does not begin until after 1200 degrees Fahr. has been passed. The best high speed tools are made by reheating to 1150 degrees Fahr.

peratures, which are the critical temperatures so far as we know for high speed steels and therefore the critical temperatures affecting red hardness. Prof. Carpenter's recent microscopic investigations on the structure of steels and the temperatures affecting this structure show radical structural changes beginning at below 1,022 degrees Fahr., and extending up to 1,292 degrees Fahr. It will be noted that the range of temperatures corresponding to these structural changes with which Prof. Carpenter has connected the quality of hardness in steels differs entirely from the range of temperatures which we found were intimately connected with the destruction or deterioration of red hardness. Now, the temperatures which impair red hardness in the latest high speed tool steels are without doubt as high or even higher than those which impaired red hardness in our original tools. All of these facts indicate clearly that the two methods as yet devised by scientists for determining the most important quality in the new high speed steels are ineffective.

And when we consider all of the facts, it is a matter of doubt whether in producing the quality of "red hardness" in tools, carbon plays the all-important part that it does in the quality of hardness. It may be questioned whether red hardness is not more intimately connected with chromium, tungsten and molybdenum in their heat treatment than with carbon.

We do not wish to discourage the type of investigation undertaken by Prof. Carpenter and Messrs. Osmond and LeChatelier. On the contrary, we believe it of very great importance to find, if possible, some simpler index or guide than is now known, to the cutting properties of high speed tools, namely, some guide or index that is simpler than making elaborate standard cutting speed tests with carefully standardized tools upon standardized forgings. This test requires so much expensive apparatus, consumes so much time, and is so slow, that a simpler index or guide which will indicate correctly the quality of high speed tools is much needed. Moreover, we believe that in time some simpler index to the property of "red hardness" in tools will be found.

(To be concluded.)

Milliken Bros., Inc., New York, have broken records on their new structural steel mills on Staten Island by rolling 356 tons of steel beams on single turn, on Friday, April 12.

ARRANGING PROGRAM

For Machinery Manufacturers and Dealers Big Meeting at Cincinnati.

Arrangements for the joint convention of the American Supply & Machinery Manufacturers Association, the Southern Supply & Machinery Dealers Association and the National Supply & Machinery Dealers Association, which will be held at the Hotel Sinton, Cincinnati, May 8, 9 and 10, are now under way. At a meeting at Cincinnati recently of committees representing the three organizations, the general preparations for the meeting were made and the program decided upon. The three organizations will meet in joint sessions on the mornings of the three days of the convention. In the afternoon, each body will hold a separate executive session and consider those questions which vitally interest its own members. To exploit matters and to insure a thorough consideration of various questions that may arise at the sessions, it was determined that a conference committee, to be composed of three members from each of the three organizations, should be appointed by the respective presidents. Questions bearing upon the work of the three organizations may be referred to this committee.

The general program of the convention is as follows:

Wednesday, May 8, 10 A. M.

Meeting called to order by President E. E. Strong, of the N. S. & M. D. A., in conjunction with other presidents.
Prayer.
Singing of America.
Address of welcome by Mayor Dempsey, of Cincinnati.
Response by President Strong.
Address by President J. A. Riechman, of the S. S. & M. D. A., Memphis, Tenn.
Address by President Strong, of the N. S. & M. D. A., Cleveland.
Address by President Samuel L. Meyer, of the A. S. & M. M. A., Cincinnati.
Address by T. James Fernley, secretary and treasurer of the National Hardware Association on "Association Work."
General remarks:
Report of joint entertainment committee.
Announcement of appointment of conference committee.

Wednesday, 2:30 P. M.

Separate executive sessions of associations.

Thursday, May 9, 10 A. M.

Joint executive sessions of the three associations. The presidents of each association will arrange for the presentation of the following subjects: Cash Discount, Re-sale Prices, Cost of Doing Business and Relations Between Dealers and Manufacturers.

Thursday, 2:30 P. M.

Separate executive sessions of the three associations.

Thursday, 8 P. M.

Banquet at Hotel Sinton.

Friday, May 10, 10 A. M.

Joint executive sessions of the three associations.

Friday, 2:30 P. M.

Separate executive sessions of the three associations.

A number of those dealers and manufacturers who will present addresses for their respective associations have been selected. For the National Supply and Machinery Dealers Association, George Puchta, of the Queen City Supply Co., Cincinnati, will present "Re-sale Prices;" George T. McIntosh, of the McIntosh Hardware Corporation, Cleveland, "Cash Discounts;" William J. McDowell, of McDowell, Stocker & Co., Chicago, "Relations Between Dealers and Manufacturers."

For the Southern Supply & Machinery Dealers Association, John G. Doon, of the Fairbanks Co., Baltimore, will discuss "Relations Between Dealers and Manufacturers;" C. B. Jenkins, of the Cameron & Barkley Co., Charleston, S. C., "Re-sale Prices;" Peter E. Blow, of the Southern Brass & Iron Co., Knoxville, Tenn., "Cash Discounts;" E. A. Peden, of the Peden Iron & Steel Co., Houston, Tex., "Cost of Doing Business."

As a courtesy to these organizations, the officers of the National Hardware Association, the Southern Hardware Jobbers Association and the American Hardware Manufacturers Association have been invited to attend the convention.

The executive committee of the National Supply & Machinery Dealers Association will meet in Cincinnati on May 6 and 7 preceding the opening of the convention to consider the usual matters referred to this body, such as reports of committees, detailed report of association work, amendments to the constitution and other items of business. This committee is composed of C. A. Strelinger, of the Charles A. Strelinger Co., Detroit; A. E. Brion, of Peter A. Frasse & Co., New York; George T. McIntosh, of the McIntosh Hardware Corporation, Cleveland, and George Puchta, of the Queen City Supply Co., Cincinnati.

Receiver For Plant.—An involuntary petition in bankruptcy has been filed in the United States district court at Scranton, Pa., against the Wolf Co., manufacturer of milling machinery, Chambersburg, Pa. The company has an authorized share capital of $250,000 and a funded debt of $150,000. An accurate statement of the liabilities and assets has not been announced, but it is stated that these will approximate $500,000 or upward. The petitioning creditors were the New York Cordage Co., Charles A. Schieren & Co. and the Richardson Scale Co., all of New York city. At their request Walker K. Sharp, of Chambersburg, was appointed receiver with full power to continue the business.

CANADIAN BOUNTIES

On Ore Smelted by Electric Process.—Large Railroad Contract.

(Special Correspondence.)

Toronto, Canada, April 12.—The Canadian government will give bounties on iron ore smelted by electric process as follows:

On pig iron manufactured from Canadian ore during the calendar years: 1909, $2.10 per ton; 1910, $2.10 per ton; 1911, $1.50 per ton; 1912, $0.90 per ton.

On steel ingots manufactured by electric process direct from Canadian ore, or manufactured by electric process from pig iron smelted in Canada by electricity from Canadian ore during the calendar years: 1909, $1.65 per ton; 1910, $1.65 per ton; 1911, $1.05 per ton; 1912, $0.60 per ton.

The Canadian Pacific railway has contracted with the Toronto Construction Co. for the construction of a line of railway from Victoria harbor on the Georgian bay to Peterborough, about 100 miles, the contract price being in the neighborhood of $20,000 per mile, or $2,000,000. The contract calls for a single track, with a grade of three-tenths per cent to be laid with 80-pound steel. The contractors will do merely the construction work, the railway company furnishing rails, ties and all material. The total cost is estimated at about $4,000,000. The building of this line, which is to be finished by April next, will considerably shorten the route for the transportation of grain to the seaboard. The wheat will be unloaded at Victoria harbor and carried by rail straight to Montreal instead of making a detour via Toronto, as at present.

J. H. Plummer, president of the Dominion Iron & Steel Co., of Sydney, N. S., has sailed for England, where he will take a month's holiday.

The big steel car ferry Ontario No. 1, built by the Canadian Ship Building Co., was launched from its yards in Toronto on April 6. This vessel, which is the largest ever constructed in Toronto, was built for the Grand Trunk Railway Co. and will ply between Cobourg, Ont., and Charlotte, N. Y., on Lake Ontario. The length of the boat is 315 feet, beam, 54 feet; depth of hold, 20 feet; height between decks, 17 feet; making her the largest car ferry of Canadian registry. She is built to run winter and summer and can carry 28 loaded coal cars. Her speed will be 15 knots per hour. The total cost is about $375,000. The ferry will be a great convenience to shippers as it will render unnecessary the handling of freight from the Pittsburg iron centers and the Pennsylvania coal fields at terminal points en route, and will effect a great saving of time.

About 100 Italians and other foreign laborers at the Hamilton Iron & Steel Co.'s plant struck April 8 for an increase in wages of 25 per cent. The company granted an increase of 10 per cent and the men went back to work.

There is great activity at the Dominion Iron & Steel Co.'s works at Sydney, N. S., especially in the rail mill. The company is now engaged on a contract for 37,000 tons of 100-pound rails for the Grand Trunk railway, to be laid on the main line. Large consignments west are also being made on the 20,000-ton rail order of the Canadian Pacific. It is generally supposed that the visit at this time of President J. H. Plummer to England, is in connection with the raising of money to operate the extensive coal areas recently acquired by the company.

TOTAL IRON PRODUCTION OF UNITED KINGDOM.

Consul Albert Halstead, of Birmingham, reports that the following table shows the production of the United Kingdom, in tons of 2,240 pounds, of the different kinds of pig iron for the last four years:

Description.	1903.	1904.	1905.	1906.
Forge and foundry	3,875,826	3,841,975	4,276,943	4,587,606
Hematite	3,760,422	3,362,883	4,070,222	3,990,820
Basic	991,610	1,192,120	1,057,999	1,263,317
Spiegel, etc.	183,346	165,680	187,573	307,645
Total	8,811,204	8,562,658	9,592,737	10,149,388

An additional feature of 1906 was the reduction of the supply of iron on hand by 166,746 tons.

Open Gun Bids. — Proposals for nickel steel gun forgings for naval guns now under construction were opened by the navy department at Washington, April 10. The contract is the largest of its kind ever let by the government involving an expenditure of $1,600,000. The Midvale Steel Co. and the Bethlehem Steel Co. submitted identical bids, and it is likely that the contract will be divided between these two companies for the furnishing of all material with the exception of three sets of six-inch 50-caliber forgings, for which the Crucible Steel Co., Harrison, N. J., was the lowest bidder. The Midvale and Bethlehem companies bid 30 cents a pound on all the forgings with deliveries varying from 25 to 75 days. The Crucible Steel Co. offered to supply the smaller forgings for 29½ cents.

STEAM TURBINE

Is Being Installed by the Colorado Fuel & Iron Co.—Brick Tests.

Pueblo, April 13.—The new steam turbine, ordered some months ago from the Westinghouse Machine Co., of Pittsburg, has just arrived and is being installed at the Minnequa plant. This turbine is the only machine of its kind west of Kansas City, and was bought at the earnest solicitation of Chief Electrician Chapman, who made an extended trip east to investigate the merits of the apparatus. It is direct connected to an alternating current generator of 500 kilowatts capacity, and runs at a speed of 5,000 revolutions per minute. In connection with this there is also to be installed a motor-generator set, consisting of a 500-kilowatt synchronous motor, connected by a flexible coupling to a direct current generator. A 1,000-horsepower condenser of the Helander type will also be installed in connection with the turbine.

A series of important brick tests is being conducted at the Minnequa plant by F. S. Adams, ceramic expert. Mr. Adams is considered an eminent authority on the subject, and will make this department a permanent one, as several thousand dollars are expended annually at the plant for brick to line the blast furnaces. The purpose of the tests is to determine the ability of the various brands to withstand the necessary abrasion, which in the furnaces is very great, and also the refractory qualities necessary for high temperatures.

The rail mill at the plant is now turning out about 1,000 tons of rails a day.

The Colorado Fuel & Iron Co., has recently ordered for use in its photographic department two powerful alternating current arc lamps. These lamps are to operate on a 2,200-volt circuit and are 18,000 candle power each. The work in this department is largely composed of making reduced photographs of drawings. These lamps were imported from Germany at a cost of several hundred dollars each, but the work in this department is so heavy at the present time that the lamps will pay for themselves in a very short time.

RAILROADS ARE SLOW

In Placing Orders for Machine Tools, But Confidence is Unshaken.

Office of THE IRON TRADE REVIEW.
1362 Monadnock Block, Chicago, April 13.

Continued dullness in large orders and activity in the general line of machine tools characterized the machinery market during the week. The reluctance of the railroads and large corporations to send out orders became more marked. Practically no new contracts have been placed and several small lists have been held up.

Curiosity has developed among the machinery men as to the long delay in placing the orders for the equipment in the new shops of the Pullman Co., the Grand Trunk railroad and the Big Four railroad. The lists have been out over six weeks in the case of the Pullman Co., and nearly as long in the other cases. The bids have been submitted and since that time nothing has been heard from them. The delay is regarded by the trade as the most important confirmation of the uneasiness felt by the railroads. They feel that, as soon as conditions become settled, the contracts will be awarded.

The confidence of the general trade has remained absolutely unshaken by the situation. The demand for tools has shown no abatement. One firm on Clinton street did as much business one day last week as it did in the entire month of April two years ago. The general feeling is that the orders placed in the first quarter of the present year will be 25 per cent greater than the corresponding period of last year. A slump is regarded as inevitable, but it is placed far in the future by the majority of dealers. "There will be a time," one Chicago agent said last week, "when we are going to have a fine opportunity to buy in at bargain prices a lot of this machinery we are selling now. But I do not think it is in the immediate future—not for a year or two, at the outside. The demand at present will prevent any possible slump in business before the end of the present year and conditions, to my thinking, show that it will not be for at least one more. The material market is sold so far ahead that an entire cessation in demand at the present time would not alter conditions."

The sentiment in Chicago is that the end of the rise in prices has been reached. "We have gone as far in that line as we can," a Canal street dealer said. "And I think we have gone far enough."

The woodworking machinery market has come into its own and the manufacturers are finding their orders running ahead to put it in the same condition with the machine tool makers. The second hand machinery market continues steady.

The L. S. Starrett Co. will move its Chicago office from 15 Canal street to 18-20 West Randolph street about April 15. It will ocupy two stores with basement and will have double the available floor space in its present quarters.

The Pratt & Whitney Co. will move May 1. It will abandon its present quarters and divide the office. The machinery sales department will move to the American National bank building, Clark and Adams streets, in the down-town district. The small tool department and the machinery warehouse will be transferred to the Plamondon building, Clinton and Monroe streets, two blocks from the present location, on the west side.

RAILROAD NEWS.

Urge Reciprocal Law.

Harry S. Grimes, of the grain firm of H. S. Grimes & Co., Portsmouth, has been elected president of the Ohio Shippers' Association. The other officers chosen were: John R. Flotron, Dayton, the retiring president A. L. Stone, Cleveland, and John H. Puck, Toledo, vice presidents, and J. W. McCord, Columbus, treasurer. In the resolutions adopted at the annual convention held in Columbus, the work of the state railroad commission was commended and the national congress was urged to enact an interstate reciprocal demurrage law and the general assembly of Ohio also asked to pass a similar measure covering interstate shipments.

New Equipment Orders.

The Binghampton plant of the American Car & Foundry Co. has received orders for 1,800 new cars, of which the Illinois Central gets 500 dumping cars for coal and ores, the Gulf & Ship Island railroad 500 flat cars and the National Railway of Mexico 800 box and flat cars. The Lehigh Valley railroad has had delivered to it since July, 1906, 2,010 box cars of 80,000 pounds capacity each, 1,000 twin hopper gondolas, 500 low-side gondolas and 15 locomotives. There are now being constructed for the company 1,000 steel hopper bottom coal cars, 25 automobile box cars, 102 produce cars, 100 cinder cars, 1,000 steel under-frame box cars of 80,000 pounds capacity each, 70 locomotives, 1,000 box cars of 80,000 pounds capacity each, 1,000 high grade gondolas, 2,000 steel hopper bottom coal cars, 1,000 flat bottom coal cars, six passenger coaches and three passenger cars.

OPEN SHOP

Must Prevail on Canal Says President Roosevelt.—Labor News.

President Roosevelt has served notice that the open shop principle must prevail in the machine shops on the Isthmus during the construction of the Panama canal. While the report of the strike among the workmen on the canal is not verified officially, it is admitted that the labor situation is not altogether satisfactory and that agitators are constantly endeavoring to unionize the men and enforce the closed shop rule. Owing to the president's firm stand, this has been prevented. The steam shovel men, who are now making demands for increased wages, are organized. The engineers of the shovels recently were granted an increase from $185 to $210 a month and are now seeking $300 a month. Cranemen are now paid $185 a month and want $250. Firemen get $83.33 a month and are asking for $110.

Wouldn't Pay Dues.

The Gillie Engine & Machine Co., Buffalo, has just passed through an attack by the boilermakers' union successfully. A few days ago, the business agent of the union demanded that the company pay the arrearages of union dues owed by a number of employes and was refused. The business agent then called out the union men who were in good standing. Those in arrears continued at work. It is said the men who had not paid their dues had a claim against the union for a strike benefit fund which accrued during the boilermakers' strike of last winter and they did not propose to pay any dues until the accounts balanced. The places of the men who struck were all filled and work is continuing as usual. The concern is a member of the Buffalo Boiler Manufacturers' Association.

Labor Notes.

Five hundred machinists of the Denver & Rio Grande railroad have been granted an increase in wages of two and three cents an hour, a nine-hour day and time and a half for overtime work. The change takes effect from Dec. 31. Engineers of the Delaware & Hudson railroad have been granted an increase averaging about 15 per cent. Freight locomotive drivers get 10 per cent, and passenger locomotive men about 20 per cent.

The Cleveland branch of the National Metal Trades' Association announces that it has secured three new members during the past month. These are the Garford Co., Cleveland and Elyria; the Bruce-Meriam-Abbott Co., and the Fanner Mfg. Co.

Reaction Brings a Fall in Securities.

Reacting from the strong recovery that had apparently checked the protracted decline extending over many months, the stock market in the past week has displayed a general sagging off in quotations. This is looked upon by followers of stocks as nothing more than the natural action of the market which, as a rule, comes closely upon a sharp advance after a period of decline. The average price of 20 railroad stocks declined two points during the past week, after having experienced a 12-point rise in the few days' interval between the reaching of the bottom of the long downward swing and April 5 when the drop was continued. The trading during the week was almost entirely professional and the volume of business was considerably contracted, as the sales aggregated 5,126,858 shares against 6,246,400 shares last week and 4,206,800 shares the corresponding week of last year. What is taken as a significant sign of approaching favorable conditions was the action of the Bank of England in reducing its discount rate from 5 to 4½ per cent during the week. Since the advance in the bank rate to 6 per cent on Oct. 18 last was regarded as a warning signal, showing the dangerous condition of credits, likewise this reduction is interpreted as an official sign that great improvement has taken place. This action is believed to be due in a great measure to the strength shown by the American banks in financing the recent panic in the New York stock market without disturbing the London market by the importing of gold. Interest among the stock traders and the business men of the country at large is now tending toward the crop situation. It is confidently believed that good crops will go a long way toward insuring the continuance of the present prosperous conditions, and for this reason the advance signs of production are being earnestly scanned. The New York bank statement was not good, as it reported an increase of nearly $37,000,000 in loans. A gain of $17,648,000 in cash was noted, but as the net deposits grew $48,948,000, the surplus revenue declined $3,588,000, and the latter now stands at less than $16,000,000. Easier money conditions continue to be shown in the New York market. Call money this week averaged 2 per cent as against 2½ per cent last week and 4 per cent last year. Sixty-day loans stood at 4¼ per cent against 4½ per cent last week, and 4¾ per cent last year. Much speculation is being indulged in as to whether these favorable money conditions will continue and the sentiment appears to be divided on this point. The bond market was not as strong as that of the week previous, the total sales aggregating $9,249,000 as against $14,670,000 for last week.

Financial Notes.

At the annual meeting of the stockholders of the Bethlehem Steel Co. the old directors were re-elected. The latter in turn re-elected the old officers, C. M. Schwab being re-elected chairman of the board. The Juragua Iron Co., a subsidiary of the Bethlehem Steel Co., re-elected its officers and directors at the annual meeting.

The stockholders of the Chase Rolling Mill Co., Waterbury, Conn., have voted to increase the capital stock from $1,200,000 to $2,500,000. It is understood that the additional stock will be taken by the present stockholders.

Recent dividend declarations include the following: Railway Equipment Corporation, regular monthly dividend of 1½ per cent and an extra dividend of 2 per cent, payable April 15; United States Cast Iron Pipe & Foundry Co., regular quarterly dividends of 1¾ per cent on the preferred stock and 1 per cent on the common stock, payable June 1; International Steam Pump Co., regular quarterly dividend of 1½ per cent on the preferred stock, payable May 1; American Seeding Machine Co., regular quarterly dividend of 1½ per cent on the preferred stock, payable April 15; Metal Producing Co., second monthly dividend of 1 per cent on the preferred stock, payable April 15.

One hundred and fifty laborers of the Richardson & Boynton Co.'s stove plant, Dover, N. J., walked out April 8 to enforce their demands for in-

THE LEADING INDUSTRIAL SECURITIES.

	Closing Quo. Apr. 13	Changes In Week	Date 1907 Ann. Meet.	Stock Outstanding	Dividend Basis	Dividend Being Paid	Dividend Date Last Div. Pay.
Allis-Chalmers	12¾	— ⅛	Sept.	19,820,000		.....	.....
Allis-Chalmers pr	33½	—1		16,150,000	7 cum	.....	Feb., 1904
American Can	6¾	+ ⅜	Feb.	41,233,300		.....	.....
Am. Can pr	57	+2⅛		41,233,300	7 cum	5 Q.	Apr., 1907
Am. Car and Fdy	36¾	— ⅞	June 27	30,000,000		2 Q.	Apr., 1907
Am. Car and Fdy pr	98½	— ⅜		30,000,000	7 n. c.	7 Q.	Apr., 1907
American Loc.	62⅛	—3½	Oct. 5	25,000,000		1¾	Feb., 1907
American Loc. pr	105	—5		24,100,000	7 cum	7 Q.	Apr., 1907
American Ship.	74	+4	Oct. 2	7,600,000	6	4 Q.	Mar. 1907
American Ship. pr	105	—2		7,900,000	7 n. c.	1¾ Q.	Jan. 1907
Am. Steel Foundries	8⅝	— ⅛	Oct. 1	15,810,000		.....	.....
Am. Steel Foundries pr.	39	— ½		17,240,000	6 cum	.....	Aug., 1904
Barney & Smith	72	.....	June 4	2,000,000	4	4	Mar., 1907
Barney & Smith pr	140	.....		2,500,000	8 cum	8 Q.	Mar., 1907
Bethlehem Steel	12½	+ ⅛	April 2	14,892,000		.....	.....
Bethlehem Steel pr	49	.....		14,908,000	7 n. c.	5 Q.	Feb., 1907
Cambria Steel	36¼	—2½	Mar. 19	45,000,000*	6	3 Q.	Feb., 1907
Cambria Iron	47	.....		8,468,000*	4	4 S. A.	Apr., 1907
Chicago Pneumatic Tool	41½	—3½	Feb. 18	6,145,800	4	4 Q.	Apr., 1907
Colorado Fuel	34½	—2¾	Oct. 21	30,132,000		.....	Apr., 1902
Crucible Steel	9	— ⅝	Oct. 16	24,578,400		.....	.....
Crucible Steel pr	71⅝	—1¼		24,436,500	7 cum	6	Mar., 1907
Empire Steel	8½	.....	Feb. 27	2,281,400		.....	.....
Empire Steel pr	49	.....		2,500,000	6 cum	3 S. A.	July, 1906
Fay & Egan	95	.....	Feb. 19	1,000,000	6	7 Q.	Feb., 1907
Fay & Egan pr	128½	.....		1,000,000	7 cum	7 Q.	Feb., 1907
General Electric	147⅞	—1½	May 14	63,643,600	8	8 Q.	Apr., 1907
Harbison-Walker	11	+1	Jan. 21	18,000,000	6	.....	.....
Harbison-Walker pr	74	.....		9,600,000	6 cum	6 Q.	Jan., 1907
International Pump	26¾	—3¼	June 4	17,762,500		2	Apr., 1905
International Pump pr	79¾	.....		11,850,000	6 cum	6 Q.	Feb., 1907
Lackawanna Steel	50	+5	Mar. 13	34,971,400		.....	.....
Lake Sup. Corp	8	.....	Oct. 2	40,000,000		.....	.....
New York Air Brake	114	—3½	June 18	10,000,000	8	8 Q.	Jan., 1907
Niles-Bement-Pond	130	.....	Feb. 6	5,000,000	6	6 Q.	Mar, 1907
Niles-Bement-Pond pr	105	.....		2,000,000	6 cum	6 Q.	Feb., 1907
Otis Elevator Co.	38	.....	March 18	6,350,300		3 A.	Apr., 1907
Otis Elevator Co. pr	92	+3		6,308,500	6 n. c.	6 Q.	Apr., 1907
Penn. Steel	65	.....	May 13	10,750,000		.....	.....
Penn Steel pr	100	+1		16,500,000	7 n. c.	7 S. A.	Apr., 1906
Pittsburg Coal Co.	11⅞	— ⅝	Feb. 11	32,000,000		.....	Nov.
Pittsburg Coal pr	55	.....		32,000,000	7	.....	Apr., 1906
Pressed Stl. Car	35	—3¼	Feb. 20	12,500,000		3	Aug., 1904
Pressed Stl. Car pr	94	.....		12,500,000	7 n. c.	7 Q.	Feb., 1907
Pullman	168¼	—1¾	Oct. 17	100,000,000	8	8 Q.	Feb., 1907
Railway Stl. Spring	45	—1½	Mar 7	13,500,000		4 S. A.	Mar., 1907
Railway Stl Spring pr	93	+1		13,500,000	7 cum	7 Q.	Mar. 1907
Rep Iron & Steel	28½	—1⅛	Oct. 9	27,191,000		.....	.....
Rep. Iron & Steel pr	85½	—1½		20,416,900	7 cum	7 Q.	Apr., 1907
Sloss-Sheffield	52⅝	—2½	Mar. 5	10,000,000	5	5 Q	Oct., 1906
Sloss-Sheffield pr	100	.....		6,700,000	7 n. c.	7 Q.	Apr., 1907
Tenn. Coal & Iron	144⅛	.....	May 7	22,553,060	4	4 Q.	Feb., 1907
U. S. Pipe & Fdy	35	—2¾	June 26	12,500,000	4	4 Q.	Dec., 1906
U. S. Pipe & Fdy. pr	82	+1		12,500,000	7 n. c.	7 Q.	Dec., 1906
U. S. Steel	36½	—1¼	April 15	508,302,500	2 n. c.	½ Q.	Mar., 1907
U. S. Steel pr	99⅜	—1⅜		360,281,100	7 cum	7 Q.	Feb., 1907
U. S. Steel 5's	98¾	— ⅛		463,798,000	5	5 A.	.....
Va. Iron, Coal & Coke	70	—4	Sept. 17	8,641,600		.....	.....
Westinghouse Elec	147	— ½	July 24	24,998,700*	10	10 Q.	Apr., 1907
West'ghouse Air Brake	148	+3	Oct. 1	11,000,000*		22½ Q.	Jan. 1907

Par value of shares, $100, except those starred.

NEWS FROM MANY INDUSTRIES.

New Buyers:—

The Ideal Pump Mfg. Co., Green City, Mo., has increased its capital stock from $25,000 to $50,000.

The Shields Cushion Car Coupler Co., Denison, O., has been incorporated with a capital of $25,000 by W. J. Anderson and others.

The Standard Galvanizing & Wrought Iron Works, Brooklyn, has been incorporated with a capital of $8,000 by Simon Simouvitz, Hyman Simouvitz and others.

The Universal Boring Machine Co., Hudson, Mass., has been incorporated with a capital of $15,000. Charles A. Clarke, of Newton, Mass., is treasurer of the company.

The Union Iron Works, Cincinnati, has been incorporated with a capital of $150,000 by R. C. and W. A. Stewart, J. F. Walton, John Hartman and N. L. Gordon.

The Whiteside Loader & Machinery Co., Indianapolis, has been incorporated with a capital of $50,000 by Sidney B. Whiteside, Henry C. Churchman and Omer V. Newman.

The Superior Iron Works Co., Superior, Wis., has been organized with a capitalization of $70,000 by Edward H. Williamson, Robert A. Brooks and Charles E. Downs.

The Manhattan Foundry Co., Brooklyn, has been chartered with an authorized capital stock of $15,000 by Max Weiss, Borehard Kessler and Rosa Weiss, all of the above address.

The Scott Metal Co., Inc., Richmond, Va., has been chartered with an authorized capital stock of $10,000 by T. B. Leonard, G. H. Scott, J. S. Haw and E. V. Breeden, all of the above address.

The Tom Brown Co., Chicago, has been organized to manufacture railway supplies and equipment with a capital of $100,000 by Tom Brown, F. H. Gansbergen and S. Fansburg.

Davis Current Motor Co., Quincy, Ill., has been organized with a capitalization of $40,000 to manufacture machinery and tools by Albert H. Davis, Ralph P. Cady and Charles H. Achelpohl.

The American Nut Co., Niagara Falls, N. Y., has been chartered with an authorized capital stock of $500,000 by Martin Nelson, Toronto; H. S. Gould, New York, and Franklin Plauter, Boston.

The Athena Steel & Wire Co., Passaic, N. J., has been incorporated to manufacture steel with a capitalization of $250,000. The incorporators are: Ferdinand Wilckes, Felix Wilckes and John M. Nolan.

The Western Iron & Steel Co., Colorado Springs, Colo., has been chartered to do a general steel, iron and brass business. The capital stock is $50,000, and the incorporators are: Orville L. Dines, L. E. Rowland and F. E. Guy.

The Universal Unexplosive Gasoline Stove & Can Co., Columbus, O., has been chartered with an authorized capital of $10,000 by Charles Kumnuler, Ferdinand Seigel, Frederick William Rieber, Nicholas Schlee and Frederick Schuler.

The Vincennes Pipe & Castings Co., Vincennes, Ind., has been organized with a capitalization of $50,000 by Charles L. Rundle, John D. Lacroix, Cornelius F. Posson, William J. Nicholson, Gustav Shiffko, Henry Balgennorth and August Sanneman.

The Mayo Iron Works, Inc., Richmond, Va., has been incorporated with a capital of $50,000 to succeed the Cameron-Tennant Machine Works, 2024 East Main street. The officers of the company are: E. C. Mayo, president; E. N. Newman, vice president; J. G. Luce, secretary and treasurer.

The George Wood Mfg. Co., 236 Bank street, Newark, N. J., has been incorporated to manufacture force feed oilers, tools, machinery, etc. The capital stock of the company is $10,000 and the incorporators are: George Wood, William H. Knapp and Charles J. Cameron, all of Newark.

New Construction:—

The Trahern Pump Co., Peoria, Ill., is planning the enlargement of its plant to more than double its present capacity.

The contract for a brick and concrete factory building, five stories, 50 x 100 feet, has been let by the Bailey Auto Co., Springfield, Mass.

The Cherry Valley Iron Co., West Middlesex, Pa., has awarded the contract for an extensive new machine shop to replace the structure recently burned.

The Locomobile Co., of America, 2 Main street, Bridgeport, Conn., has awarded the contract for a brick automobile factory, four stories high, 50 x 140 feet.

Tracy Bros. Co., Waterbury, Conn., has been awarded the contract by the Union Hardware Co., Torrington, Conn., for a brick factory building, two stories, 100 x 150 feet, with an ell, 40 x 60 feet.

The Minneapolis Steel & Machinery Co., Minneapolis, is making extensive improvements to its plant. The structure will be 60 x 293 feet with an elevation of 50 feet and will be added to both the machine shop and foundry. It is expected that it will be ready for operations by May 1.

Work of constructing the plant for the Lumsden & Van Stone Co., 69 High street, Boston, has been inaugurated and the foundations are now under way. The plant will be of reinforced concrete construction, including a foundry, 90 x 210 feet, one story. A machine shop, brass turning shop and pattern storehouse are also contemplated.

The Witte Iron Works Co., Kansas City, Mo., has awarded the contracts for an extensive new plant in that city. The plant will have 60,000 square feet of floor space in the main workshop, and will be used for the manufacture of gasoline and gas engines. Ground will be broken as soon as the structural steel for the building is delivered.

The Williams Foundry & Machine Co., Akron, O., which recently underwent a severe damage by fire, is at present rebuilding its foundry by erecting a new brick building, 40 x 80 feet, with wing and top house, which will be equipped with a traveling crane. As the power plant and most of the equipment were not damaged by the fire, the company is only adding a new cupola and power blower.

The Milwaukee Refrigerator Transit Co., Milwaukee, announces that it will at once begin the erection of its new car plant consisting of an erecting shop, 100 x 200 feet, which will have a capacity of 12 cars per day. The wood mill, blacksmith shop and machine shop will be in proportion to the erecting shop, and will be fully equipped with the latest improved machinery. T. F. Howe is general manager.

The National Acme Mfg. Co., Cleveland, O., manufacturer of screw machines, has begun work on an extensive new addition, 402 feet long, six stories, including basement. Increasing demands upon its capacity have forced the company to erect the new addition to its present building which is now one-eighth of a mile long. A rearrangement of the plant will be made when the new structure is com-

pleted. Practically all the equipment for the extension has been provided for and very few machines are required at this time.

The Benton Harbor Malleable Iron Co. has prepared plans for the erection of a new malleable iron foundry to be built at Thirty-fifth street and Ashland avenue, Chicago. The plant will be 90 x 207 feet, two stories, of steel construction with concrete foundation and floor. Other buildings will be erected in connection. Architects Raeder & Wood, Chicago, are also preparing plans for a malleable iron plant to be built at Benton Harbor, Mich, for the same company. The main building will be one story, 60 x 260 feet, of brick and steel construction. Guy S. Bartis, 2842 Archer avenue, Chicago, is president of the company.

The Savill-Chandler Co., Canton, Ill., reports that its new plant, which will cover between 15,000 to 16,000 square feet of floor space, is now about two-thirds done. It is the intention of the company to equip the new shops for building mine cars with the utmost economy in manufacturing cost and along more mechanical lines than has generally been followed by car makers in the past. It will also be prepared to do a general machine and foundry business and expects to add to its lines from time to time other items in mine equipment, such as cages, fans, screens, etc. The company states that it will be obliged to install new wood-working machines and some new metal-working machinery suitable for this class of work.

The Galion Iron Works, Galion, O., manufacturer of cast iron culvert pipe and general founder, recently organized, reports that it has purchased a site of between four and five acres, situated in the southern part of that city at the junction of the Big Four and Erie railroads, upon which it will erect its plant. The main building will be 60 x 200 feet, and in addition there will be a power plant, cupola room, storage sheds, etc. It is expected that the contracts will be placed in a few days for the equipment, which will consist of cupola, jib crane, traveling crane, trolleys, gas engine, blower, industrial cars and other foundry apparatus. The company has had its culvert pipe on the market for the past three years, having manufactured it under contract in a neighboring foundry.

The Reading Iron Co., Reading, Pa., reports that its new erecting shop at its Scott foundry department will be 62 feet center portion by 200 feet with a crane runway 60 feet above the floor line. There will be a lean-to on both sides 40 feet wide with crane runways 25 feet above the floor line. The overhead electric traveling cranes will be of 50, 25 and 10 tons capacity. The structural steel skeleton will be furnished by the McClintic-Marshall Construction Co. and the cranes by the Niles-Bement-Pond Co. There is no intention to buy many new machine tools for the present, as the chief object in building the addition is to make more room in the present machine shop which is overcrowded. The Reading Iron Co. has also just completed a new foundry of over double the capacity of the old one. The product of the Scott foundry department consists of blast furnace and rolling mill machinery, large steam engines, hydraulic machinery, cotton compresses and sugar mills. Several experimental guns, including the 6-inch and 10-inch Brown wire wound guns, have also been manufactured in this department.

The Monitor Stove & Range Co., Cincinnati, recently organized, will take over the business formerly operated under the name of Wm. Resor & Co., one of the pioneer stove manufacturing concerns of the west and also one of the largest. This concern has been in business since 1819. The recent disastrous fire which visited the works has necessitated some extensive improvements and a site has been acquired. Plans have been completed by H. Hake, the architect, and the contract let for the construction. It is expected that the additions will be completed in 60 days. The present building consists of a foundry, 160 x 250 feet, to which will be added a three-story warehouse and shipping department, 60 x 160 feet, and a mounting room, 60 x 290 feet, two stories. The nickel and cleaning departments will be one story, 50 x 130 feet, and the carpenter, pattern shop and pattern storage buildings will be 40 x 130 feet. These extensions will more than double the output of the former company. The officers of the new organization are: W. H. Schmidlapp, president; E. W. Hake, vice president and general manager; I. Burnet Resor, secretary and treasurer, and J. W. Dupuy, superintendent.

The Federal Railway Signal Co., whose machine shop at Troy, N. Y., was completely destroyed by fire, Jan. 31, has, during the past month purchased the property of the Albany Forge Co., which is located on the lines of the N. Y., C. & H. R. R. R. and the D. & H. R. R. at Albany, N. Y. The property of the Albany Forge Co. consists of a completely equipped machine, pattern, carpenter shop and store room, which together with machinery recently purchased will enable the Federal company to commence at once the manufacture of signal material to as great an extent as it was manufacturing prior to the fire. The shops are located on a plot of 19 acres of land on which the Federal company proposes to put buildings as its future business demands them. The company is arranging to build an additional two-story building, 100 feet x 350 feet, for a machine shop, and a building, 60 feet x 150 feet, for a foundry to take care of its increasing business, it having been demonstrated during the six months previous to the fire that the plant at Troy was inadequate. On the completion of these buildings, the offices, foundry and blacksmith shop will be moved from Troy to the new location. The directors of the company are as follows: Robert C. Pruyn, president of the National Commercial bank of Albany; James H. Caldwell, president of the Troy Trust Co. of Troy, N. Y.; J. T. Cade, Lawrence Griffith, P. G. Ten Eyck. The officers are: J. T. Cade, president; Lawrence Griffith, vice president; P. G. Ten Eyck, general manager; Frederic Pruyn, treasurer; C. E. Newman, secretary.

General Industrial Notes:—

The Maxwell & Fitch Co., Rome, N. Y., manufacturer of gas and gasoline engines, has been reorganized and the capital stock increased. The officers of the reorganized company are: President, L. M. Fitch; secretary-treasurer and general manager, Thomas Steele.

The Paterson Brass Foundry, recently incorporated, has its works and general office at 42 Van Houten street, Paterson, N. J., and its New York office at 10 Wall street. The officers of the company are: P. O. Dixon, president; Samuel Hart, vice president and general manager, and O. O. Dixon, secretary and treasurer.

T. B. Wilson has been elected president of the Globe Iron Works, Menominee, Wis., and H. W. Young vice president to succeed A. Dollenmayer, resigned. Mr. Young has also succeeded G. A. Chaffee on the board of directors. C. W. Moffett has resigned as superintendent and F. E. Watkins, formerly of Beloit, will serve as both superintendent and manager.

The Flexible Steel Lacing Co., 173 South Canal street, Chicago, states that it proposes to manufacture flexible steel lacing for machinery belts. The company will not do any building at present. Its equipment will consist of power punch presses for dies suitable for the

work, and it hopes to place its goods on the market before the close of the present month.

The Hamilton Iron & Steel Co., recently organized to erect a blast furnace near Hamilton, O., has elected the following officers: George L. Pearson, Pittsburg, president; Edwin L. Ohl, Pittsburg, vice president and chairman of the executive committee; R. E. Field, secretary and treasurer; N. S. Keith, W. R. Todd and F. F. Dinsmore, Cincinnati, and O. V. Parrish, Hamilton, directors. The Keystone Construction Co. has been chartered by E. L. Phillips, A. E. Richards, A. D. Alcorn, Logan Cambron and H. V. Sampson to erect the plant for the Hamilton company.

The Unity Connellsville Coke Co., composed of men from Fayette and Westmoreland counties, Pa., has been organized and a deal has been closed whereby the Owen Murphy, Jacob Bumbaugh, Joseph Eaton and Louise Bates tracts of coal between Mt. Pleasant and Latrobe in the old Connellsville field have been purchased. The deal includes 125 acres of land. Work will be started at once upon the erection of 100 coke ovens, in addition to houses for the workmen and a store. Wade H. Echard, of Uniontown, is president of the company.

James Lee & Co., 76 William street, New York, for 82 years widely known in the chemical trade, have been succeeded by C. Tennant, Sons & Co., London, who will carry on the business. The Tennant and Lee companies have been closely identified for years. The firm of James Lee & Co. was formally dissolved by the death of William E. Leech, Sept. 29, 1906, as James Lee, from whom the company took its name, had died in 1877. The remaining partner, John E. Leech, now retires from active business life, although he will be vice president of the company and will remain with it in an advisory position.

The Milwaukee Motor Co., Milwaukee, expects to occupy its new plant in that city July 1. The new plant is being built entirely of cement blocks and will be composed of three large buildings, including a main building 175 x 200 feet, a foundry 60 x 100 feet and other buildings. The new power plant will contain a 125 horsepower gas engine, combined with a gas producing machine with direct connected motor, and the entire investment involves an expenditure of about $100,000. The company employs 300 men and for the year 1908, commencing July 1, expects to make and deliver 3,000 motors, the largest part of which has already been contracted for. The company was organized five years ago and has enjoyed an expansion ever since. It is capitalized at $50,000, and the present officers are: President, E. E. Warner; vice president, H. B. Warner; secretary, A. W. Warner; treasurer, George Ferry.

Trade Notes:—

The Pacific Hardware & Steel Co. will move its New York office April 20 to rooms 604-605 Postal Telegraph building, 253 Broadway.

The Lackawanna Steel Co. has moved into its new offices on the eighteenth floor of the United States Express Co.'s building, No. 2 Rector street, New York.

C. W. Whiting, a graduate of Stevens Institute of Technology, and a member of the American Society of Mechanical Engineers, announces that he has opened offices as consulting engineer at 33 Broad street, Boston.

The Crocker-Wheeler Co., Ampere, N. J., has established an office in Birmingham, which will be in charge of B. A. Schroeder, formerly New York representative of that company. The office will be in the Woodward building.

The Chicago Pneumatic Tool Co. has moved its sales and factory offices to 820 Arch street, Philadelphia. At this location a full stock of new tools and parts has been installed and arrangements have been made for repairing pneumatic and electric tools.

At the recent International Exhibition held at Liege, Belgium, the Armstrong Bros. Tool Co., Chicago, manufacturer of patent lathe and planer tools and other machine shop specialties, was awarded a medal for its exhibit of lathe and planer tool holders.

The American Galvanizing Co. has been recently formed to acquire the patents of Sherard Cowper-Cowles of England for his process of "Sherardizing" or galvanizing. The address of the company is care H. W. Poor & Co., 33 Wall street, New York.

The Goldschmidt Thermit Co., New York, has removed its offices to the fourteenth floor of the West Street building, 90 West street, between Cedar and Albany streets, New York. The company announces that it has opened a Pacific coast branch at 432-436 Folsom street, San Francisco, under the management of L. Heynemann, for business in the states of California, Oregon, Washington and Nevada.

Dr. Otto Wuth, 8 Wood street, Pittsburg, announces that on account of his ill health, Crowell & Murray, of Cleveland, have taken over his entire laboratory equipment and the good will of his business. Crowell & Murray are located at 407 Perry-Payne building, Cleveland, and Dr. Wuth states that the persons wishing to consult him can reach him through that address.

All of the steam-fittings used on the boilers of the two steamboats Yale and Harvard, built by the W. & A. Fletcher Co., Hoboken, N. J., for the Maine Steamship Co., were made by the Riverside Steel Casting Co., Newark, N. J. This concern has just entered the third year of its business career and has gained a well-grounded reputation for crucible steel castings, through excellent workmanship and prompt delivery.

On May 1 the Clinton Wire Cloth Co., Clinton, Mass., will remove its New York office from 33 Park place to 261 Broadway. At the same time, the Chicago office will be removed from 237 Lake street, to 30 and 32 River street. For over half a century this concern has been manufacturing wire cloth of every description, embracing woven wire fence, electrically welded wire fabrics for concrete construction, wire lath, hexagonal netting, perforated metals, etc.

The New York branch of the Green Fuel Economizer Co. has removed to the new West Street building, No. 90 West street, in common with many other large and well-known engineering firms. The new offices will be considerably larger than the old, in order to take care of the increasing business in economizers, fans, blowers and exhausters. Since entering the fan business, this company has built many large fans for mechanical draft, including several with over-hung wheels, larger than any of this type ever built before. The Green Fuel Economizer Co.'s New York representative is William Downs, who has occupied the old offices at No. 74 Cortlandt street, since 1889.

Fires:—

The Eagle Iron Foundry, owned by Frank W. Tilden, Hinsdale, N. H., was severely damaged by fire April 1.

The foundry of C. H. McCutcheon, Buffalo, N. Y., was damaged $2,000 by fire April 6; fully insured.

The brass foundry of the J. G. Brill Co.'s car works, Philadelphia, was damaged to the extent of $20,000 by fire April 4.

The foundry of James Gurney & Co., Border street, East Boston, Mass., was damaged to the extent of $7,500 by fire April 6. Insurance is ample.

The structural department of the Hetherington & Berner Structural Iron Works, Indianapolis, suffered a loss April 1 by fire that threatened for a time to cause more disastrous results.